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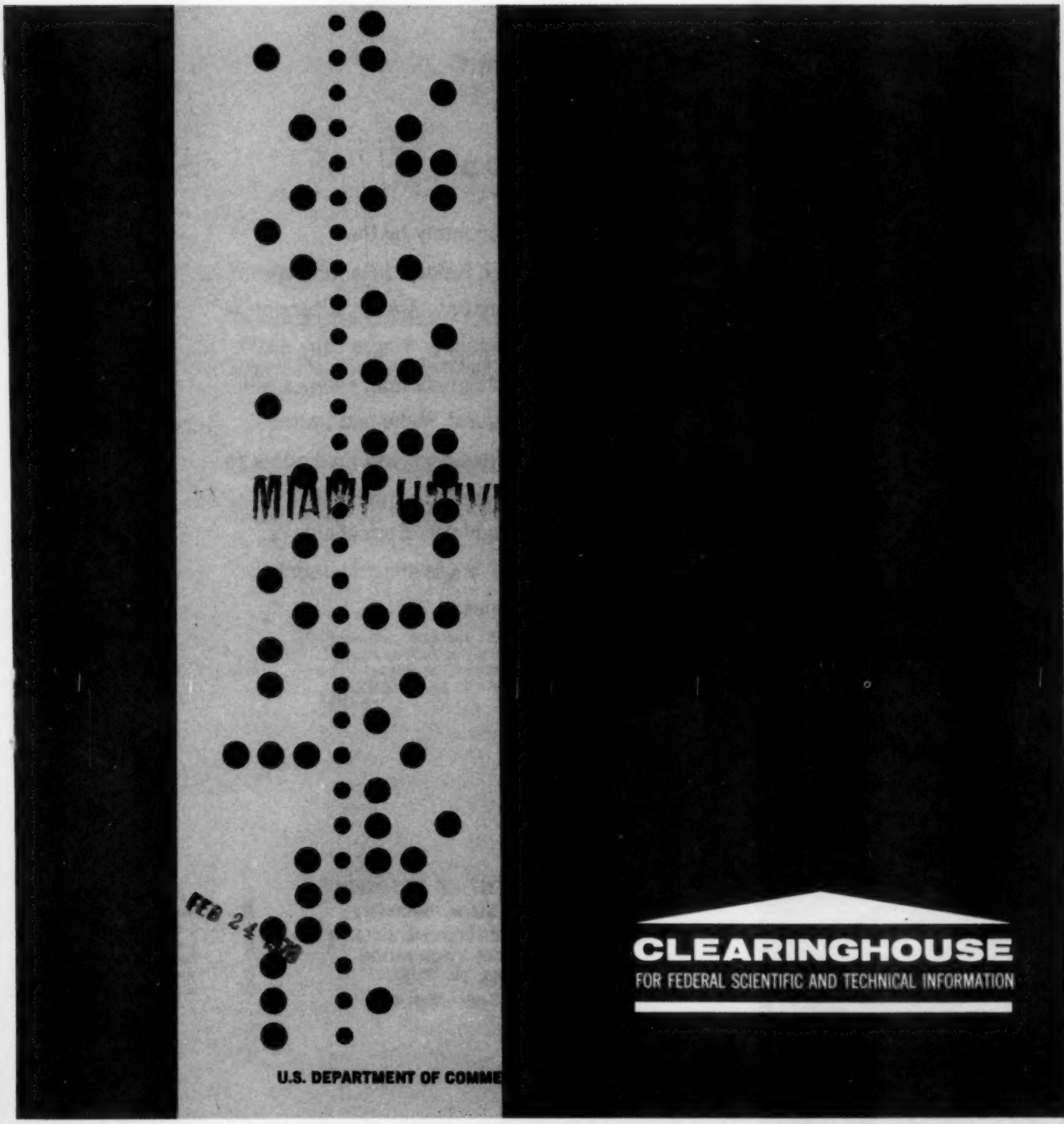

U.S. GOVERNMENT RESEARCH & DEVELOPMENT REPORTS

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U.S. GOVERNMENT RESEARCH & DEVELOPMENT REPORTS

Vol. 70, No. 3 February 10, 1970

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INTRODUCTION

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The journal is produced by computer from machineable records generated by the Clearinghouse, AEC, DoD, and NASA which are converted into compatible machine language and electronically composed at the Government Printing Office.

22 SUBJECT CATEGORIES

In the body of the journal, reports are announced in 22 subject categories called "Fields." Each Field is divided into subcategories called "Groups." The subject arrangement follows the *COSATI Subject Category List* (AD-612 200). An edge index on the back cover provides easy access to the Fields within the journal.

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A typical entry includes the title (in bold face type), basic bibliographic information, descriptive terms, an abstract in most cases, the accession number, and price. Typical entries are shown on page iv.

No abstracts are given at this time for AEC and NASA reports, instead the reader is referred to the journal of original announcement—*Nuclear Science Abstracts (NSA)* or *Scientific & Technical Aerospace Reports (STAR)*. When machine conversion programs are complete, AEC and NASA abstracts will be included.

Descriptors and identifiers provide added subject definition. Descriptors considered of most value appear first in parentheses with their modifiers. Descriptors and open-end identifiers preceded by an asterisk are included in the subject index.

Reports covering more than one subject are announced in the primary field and cross-referenced to other fields.

A Locator List at the end of the journal gives the COSATI Field/Group location of each report cited in this issue.

The American Society for Testing and Materials (ASTM) Coden, a unique five-letter code for periodical titles designed to aid mechanical and electronic storage and retrieval of information, is included on the cover of the journal.

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All reports announced in *USGRDR* are indexed by subject, personal author, corporate author, contract/grant number, and accession/report number in *U.S. Government Research & Development Reports Index*. The Index is published semi-monthly and sold on subscription at $22 a year ($27.50 foreign) or single copy at $3. Order from the Clearinghouse, Springfield, Virginia 22151, or through your Department of Commerce Field Office.

Quarterly and Annual Cumulations are also published. These Indexes are priced separately and announced by the Clearinghouse when available.

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13. MECHANICAL, INDUSTRIAL, CIVIL AND MARINE ENGINEERING

13B. Civil Engineering

ACCESS TO AIRPORTS: SELECTED REFERENCES.
Federal Aviation Administration, Washington, D.C. For primary bibliographic entry see Field 1E.
AD-662 414 HC$3.00 MF$0.65

STATE PLANNING PROGRAMS OPERATING WITH FEDERAL URBAN PLANNING ASSISTANCE.

Council of State Planning Agencies, Washington, D. C.
1965, 61p*

Descriptors: (*Urban planning, Budgets), (*Management engineering, *Professional personnel), Economics, Housing, Natural resources.

Identifiers: *Management engineering

The report is a directory of state planning programs. Only information returned in response to a questionnaire is included in the directory. Information categories include program name, responsible agency, program director, budget, staff, consultants, published reports, program description and completion dates. Information for twenty-five states is included.
PB-176 706 HC$3.00 MF$0.65

STUDY OF THE MECHANICS OF SLIDE DAMS WITH SAND MODELS.
Michigan Technological Univ., Houghton.
George A. Young, Apr67, 107p
Contract AT(29-1)-789

Descriptors: (*Dams, Civil engineering), (*Terrain models, Particle size), Cratering, Velocity, Density, Impact.

For abstract, see NSA 2116.
SC-RR-67-24 HC$3.00 MF$0.65

SUBJECT FIELD AND GROUP STRUCTURE

(Use Edge Index on back cover to locate subject Field in the journal)

FIELD 1. AERONAUTICS

Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE

Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS

Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES

Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES

Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES

Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects

FIELD 7. CHEMISTRY

Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY

Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING

Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive)

Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS

Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES

Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT

Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES

Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY

Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD. 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY

Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE

Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS

Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS

Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY

Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

R&D REPORTS AND TRANSLATIONS

1. AERONAUTICS

1A. Aerodynamics

EFFECT OF AIRFOIL SHAPE ON THE AERODYNAMIC CHARACTERISTICS OF A WING NEAR A GROUND-PLATE SURFACE.
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
For primary bibliographic entry see Field 1C.
AD-697 900 HC$3.00 MF$0.65

VELOCITY PROFILE, SKIN-FRICTION BALANCE AND HEAT-TRANSFER MEASUREMENTS OF THE TURBULENT BOUNDARY LAYER AT MACH 5 AND ZERO-PRESSURE GRADIENT.
Naval Ordnance Lab White Oak Md
For primary bibliographic entry see Field 20D.
AD-697 929 HC$3.00 MF$0.65

STABILITY THEORY FOR A PAIR OF TRAILING VORTICES,
Boeing Scientific Research Labs Seattle Wash Flight Sciences Lab
For primary bibliographic entry see Field 20D.
AD-697 950 HC$3.00 MF$0.65

MINIMUM ENERGY HYPERSONIC NOSE AND LEADING EDGE SHAPES,
Naval Ship Research and Development Center Washington D C Aerodynamics Lab
For primary bibliographic entry see Field 20D.
AD-697 951 HC$3.00 MF$0.65

TWO-DIMENSIONAL POTENTIAL FLOW THEORY FOR MULTIPLE BODIES IN SMALL-AMPLITUDE MOTION,
Mcdonnell Douglas Corp Long Beach Calif Douglas Aircraft Div
For primary bibliographic entry see Field 20D.
AD-697 969 HC$3.00 MF$0.65

ACCURACY OF DIFFERENTIAL APPROXIMATION FOR RADIATIVE IONIZATION IN COLD PRECURSOR OF AXISYMMETRIC DETACHED SHOCK,
Brown Univ Providence R I Div of Engineering
For primary bibliographic entry see Field 20I.
AD-697 974 HC$3.00 MF$0.65

THE CALCULATION OF THE FLUCTUATING LIFT ON A CIRCULAR CYLINDER AND ITS APPLICATION TO THE DETERMINATION OF AEOLIAN TONE INTENSITY,
Advisory Group for Aeronautical Research and Development, Paris (France).
J. H. Gerrard. Apr 63, 22p AGARD-463
NATO furnished. Presented at AGARD Specialists' Meeting on 'The Mechanism of Noise Generation in Turbulent Flow' at Training Center for Experimental Aerodynamics, Rhode-Saint-Genese, Belgium, 1-5 Apr 63.

Descriptors: (*Cylindrical bodies, Lift), (*Vortices, *Sound), Aerodynamic noise, Intensity, Incompressible flow, Oscillation, Reynolds number.
Identifiers: Aeolian tones.

The formation of vortices behind a circular cylinder in incompressible flow is discussed both physically and theoretically. A comparison is made between theoretical and experimental values of the oscillating lift experienced by the cylinder. The variation of aeolian tone intensity with Reynolds number is discussed and related to the oscillating lift and the correlation length of fluctuation at points separated along the length of the cylinder. (Author)
N64-16539 HC$3.00 MF$0.65

MEASUREMENTS OF FLUCTUATING 'STATIC' AND TOTAL-HEAD PRESSURE IN A TURBULENT WAKE,
Advisory Group for Aeronautical Research and Development, Paris (France).
M. Strasberg. Apr 63, 32p AGARD-464
NATO furnished. Presented at AGARD Specialists' Meeting on The Mechanism of Noise Generation in Turbulent Flow' at the Training Center for Experimental Aerodynamics, Rhode-Saint-Genese, Belgium, 1-5 Apr 63.

Descriptors: (*Cylindrical bodies, Pressure), (*Turbulence, Subsonic characteristics), Wake, Measurement, Reynolds number, Correlation techniques.

The spectra of the fluctuating 'static' and total-head pressures were measured in the turbulent wake behind a cylinder, at subsonic velocities and Reynolds number from 10,000 to 100,000, based on cylinder diameter. The spectra of the pressure are of the same form as the spectra of the longitudinal velocity fluctuations. The observed spectral magnitudes are compared with theoretical estimates. Possible sources of error in the fluctuating pressure measurements are evaluated. (Author)
N64-18717 HC$3.00 MF$0.65

AN INVESTIGATION OF THE EFFECTS OF ROLL-SPIRAL COUPLING ON THE LATERAL-DIRECTIONAL HANDLING QUALITIES OF A STOL SUBSONIC TRANSPORT.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
F. L. Moore. 1969, 71p NASA-TM-X-61898

Descriptors: *Directional stability, *Lateral oscillation, *Rolling moments, *Short takeoff aircraft, Control simulation, Control stability, Lateral stability, Transport aircraft.

For abstract, see STAR 07 24.
N69-40101 HC$3.00 MF$0.65

EMPIRICALLY DETERMINED WIND AND SCALE EFFECTS ON HOT GAS RECIRCULATION CHARACTERISTICS OF JET V/STOL AIRCRAFT.
Bell Aerosystems Co., Buffalo, N. Y.
W. J. Cosgrove, and P. E. Ryan. Oct 69, 128p
NASA-CR-1445, BAC-2099-956005
Contract NAS1-7463
Coll- 128 P Refs

Descriptors: *Circulation, *High temperature gases, *Jet aircraft, *Scale models, *V/stol aircraft, *Wind effects, Aircraft configurations, Inlet nozzles, Ratios, Temperature gradients.

For abstract, see STAR 07 24.
N69-40776 HC$3.00 MF$0.65

PRESSURE DISTRIBUTION OF A LARGE SEMISPAN TILTING WING WITH 0.4-DIAMETER-CHORD, SINGLE- SLOTTED FLAP, AND A SINGLE PROPELLER 0.22 CHORD BELOW WING.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
M. P. Fink, and C. C. Smith, Jr.. Oct 69, 380p
NASA-TN-D-5481
Contract 721-01-11-04-23

Descriptors: *Pressure distribution, *Tables (data), *Tilt wing aircraft, Aerodynamic characteristics, Performance tests, Propeller drive, Scale models, Semispan models, V/stol aircraft, Wing flaps.

For abstract, see STAR 07 24.
N69-40876 HC$3.00 MF$0.65

TRANSTABILITY FLUTTER ANALYSIS OF SIMPLY SUPPORTED SKEW PANELS.
Indian Inst. of Science, Bangalore. Dept. of Aeronautical Engineering.
S. Durvasula, and E. S. Nair. Aug 69, 35p AE-2525

Descriptors: *Flutter analysis, *Fourier series, *Rayleigh-ritz method, *Wing panels, Aerodynamic loads, Aircraft stability, Dynamic pressure.

For abstract, see STAR 07 24.
N69-41145 HC$3.00 MF$0.65

1B. Aeronautics

INJURY POTENTIAL OF EJECTION SEAT CUSHIONS,
Wyle Labs Rockville Md Payne Div
Peter R. Payne. 23 Jul 68, 7p AMRL-TR-69-134
Contract F33615-67-C-1912
Availability: Pub. in Jnl. of Aircraft, v6 n3 p273-278 May/Jun 69.

Descriptors: (*Ejection seats, *Aviation safety), (*Aviation injuries, Ejection seats), Human engineering, Spinal column, Spinal cord, Acceleration tolerance, Thickness.
Identifiers: *Ejection seat cushions.

The current MIL Specification dynamic model of the human body for the seated, spinal case, is used to determine how the dynamic characteristics of an ejection seat cushion influence the incidence of spinal injury during ejection. The theory is compared with computer studies and shows reasonable agreement. A more sophisticated dynamic model of the human body may be needed before too much reliance can be placed upon the conclusions reached in the analysis. However, the general approach seems to be valid, and the conclusions are broadly consistent with operational experience, namely that a thin, soft cushion may slightly attenuate the spinal injury potential of an ejection seat, whereas a thick, stiffer cushion will magnify the injury potential. (Author)
AD-697 886

COMPUTER/SIMULATION STUDY OF AIR DERIVED SEPARATION ASSURANCE SYSTEMS IN MULTIPLE AIRCRAFT ENVIRONMENT.
Final rept.,
Collins Radio Co Cedar Rapids Iowa
J. M. Holt, and G. R. Marner. Oct 69, 78p Rept no. 523-0761821-00111M FAA-RD-69-31
Contract FA-WA-4598

Descriptors: (*Flight paths, Separation), (*Aviation safety, *Air traffic control systems), Aviation accidents, Simulation, Air traffic, Hazards, Scheduling, Pilots.
Identifiers: CAS (Collision Avoidance Systems), *Collision avoidance systems, Computerized simulation, General aviation accidents.

The report reexamines, in the light of present understanding, earlier concepts and conclusions reported in the three interim reports. The best current answers to the problems posed by the program objectives are presented. In addition, some important remaining problems are identified and, where possible, a new course of action that seems promising is recommended. Significant among these is the new light and new emphasis on collision avoidance afforded by the upcoming changes to ATC.
AD-697 942 HC$3.00 MF$0.65

DESIGN STUDY OF A TACTILE CUING SYSTEM FOR PILOT TRAINING.
Stanford Research Inst Menlo Park Calif
For primary bibliographic entry see Field 14B.
AD-697 991 HC$3.00 MF$0.65

THE PROBLEMS OF DESIGNING FOR THE TAKE-OFF AND LANDING OF HIGH SPEED AIRCRAFT,
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 1C.
N64-13151 HC$3.00 MF$0.65

EFFECT OF JET TEMPERATURE ON JET AND PURE TONE NOISE RADIATION.
Lockheed-georgia Co., Marietta.
For primary bibliographic entry see Field 20A.
For abstract, see STAR 07 24.
N69-40439 HC$3.00 MF$0.65

AUTOMATION, SIMULATION AND DATA HANDLING IN CIVIL AVIATION BALPA TECHNICAL SYMPOSIUM.
British Air Line Pilots Association, Hayes (England).

1968, 190P C-171
Conf- Proc. of 5th Ann. Balpa Tech. Symp., Held 26-28 Nov. 1968

Descriptors: *Air traffic control, *Airline operations, *Automatic control, *Conferences, *Data systems, *Simulators, Airports, Airspace, Digital computers, Man machine systems, Telecommunication, Weather forecasting.

For abstract, see STAR 07 24.
N69-40702 HC$3.00 MF$0.65

A DESIGN STUDY OF A METROPOLITAN AIR TRANSIT SYSTEM.
Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.
For primary bibliographic entry see Field 1C.
For abstract, see STAR 07 24.
N69-41102 HC$3.00 MF$0.65

1C. Aircraft

INJURY POTENTIAL OF EJECTION SEAT CUSHIONS,
Wyle Labs Rockville Md Payne Div
For primary bibliographic entry see Field 1B.
AD-697 886

QUARTERLY BULLETIN OF THE DIVISION OF MECHANICAL ENGINEERING AND THE NATIONAL AERONAUTICAL ESTABLISHMENT.
Rept. for 1 Apr-30 Jun 69.
National Research Council of Canada Ottawa (Ontario) Div of Mechanical Engineering
Jun 69, 97p Rept no. DME/NAE-1969 (2)
See also AD-689 274.

Descriptors: (*Vertical take-off planes, *Test equipment), (*Nickel alloys, Thermal properties), (*Metallography, X-ray spectroscopy), Heat-resistant metals+ alloys, X-ray diffraction analysis, Flight control systems, Flight instruments, Handling, Mechanical engineering, Aeronautics, Canada.
Identifiers: SG 1262 hover test rig, Superalloys, X ray metallography.

Contents: A brief evaluation of the handling qualities of the SG 1262 hover test rig; The sources of the elevated temperature properties of cast nickel-base superalloys; The application of X-ray metallography to problems of the materials laboratory; Current projects of the division of mechanical engineering and the national aeronautical establishment.
AD-697 892 HC$3.00 MF$0.65

EFFECT OF AIRFOIL SHAPE ON THE AERODYNAMIC CHARACTERISTICS OF A WING NEAR A GROUND-PLATE SURFACE.
R. E. Gibson Library bulletin translation series, Johns Hopkins Univ Silver Spring Md Applied Physics Lab
A. I. Yukhimenko. 18 Sep 69, 15p Rept no. APL-CLB-3-T-603
Contract NOw-62-0604
Trans. of Gidrodinamika Bolshikh Skorostei (USSR) n2 p34-46 1966, by L. J. Holtschlag.

Descriptors: (*Wings, *Ground effect), Aerodynamic configurations, Aerodynamic characteristics, Numerical analysis, One-dimensional flow, Slender bodies, Interfaces, Incompressible flow, Angle of attack, USSR.
Identifiers: Translations.

Considered is the two-dimensional problem of motion of a slender wing in a potential fluid flow at small distances from a solid ground-plate, which corresponds to the case of high-speed motion of a wing above the interface between two fluids of different density. The problem is solved under the assumption that the fluid is ideal and incompressible, the motion outside the wing is potential, the wing is slender, and the angles of attack are small. (Author)
AD-697 900 HC$3.00 MF$0.65

STABILITY THEORY FOR A PAIR OF TRAILING VORTICES,
Boeing Scientific Research Labs Seattle Wash Flight Sciences Lab
For primary bibliographic entry see Field 20D.
AD-697 950 HC$3.00 MF$0.65

AEROSPACE-AFML CONFERENCE ON NDT OF PLASTIC/COMPOSITE STRUCTURES, DAYTON, OHIO, MARCH 18-20, 1969.
Air Force Materials Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 14B.
AD-697 956 HC$3.00 MF$0.65

VERTICAL LANDING AND TAKEOFF AIRCRAFT,
Army Foreign Science and Technology Center Washington D C
Viktor Fedorovich Pavlenko. 21 Oct 69, 275p Rept no. FSTC-HT-23-967-68
Trans. of mono. Samolety Vertikalnogo Vzleta i Posadki, Moscow, 1966 343p.

Descriptors: (*Vertical take-off planes, Design), Aircraft engines, Performance (Engineering), Take-off, Aircraft landings, Lift, Flight control systems, Aviation safety, Exhaust gases, Runways, USSR.
Identifiers: Transition flight, Translations.

The book is devoted to new types of flying craft -- vertical takeoff and landing aircraft (VTOL). These aircraft make it possible to obviate the need for awkward and vulnerable airfields and can carry out rapid and sweeping flight maneuvers. They also mean that hauling of passengers and cargo in local airlines can be done with greater efficiency and more economically. (Author)
AD-698 159 HC$3.00 MF$0.65

FEASIBILITY STUDY OF A BALLOON SKYHOOK,
Naval Ordnance Lab., White Oak, Md.
For primary bibliographic entry see Field 19D.
AD-827 280 HC$3.00 MF$0.65

THERMAL BUCKLING OF PLATES AND CURVED SHELLS IN SUPERSONIC GAS FLOW,
Joint Publications Research Service, Washington, D.C.
V. V. Bolotin. 26 Nov 69, 41p
Trans. of Raschety na Prochnost. Teoreticheskie i Eksperimentalnye Issledovaniya Prochnosti Mashinostroitelnykh Konstruktsii. Sbornik Statei (USSR) n6 p190-216 1960.

Descriptors: (*Airplane panels, Structural shells), (*Metal plates, Thermal properties), Buckling (Mechanics), Deformation, Modulus of elasticity, Stresses, Approximation (Mathematics), Equations, Interactions, Supersonic flow, USSR.
Identifiers: Translations.

The problem of great deflections and stability of plates and shells in supersonic gas flow is of considerable practical interest. Several particular problems on temperature buckling of plates and shells in gas flow have been considered before. In this paper is given the derivation of the general equations describing the thermal deformation of plates and curved shells in gas flow; excessive gas pressure will be introduced according to the known theory for supersonic flows. The obtained equations are used for the investigation of heated plane and curved panels in the postcritical stage taking into account nonlinear boundary conditions and excessive gas pressure dependent upon the deformation of the surface around which the gas flows. (Author)
JPRS-49331 HC$3.00 MF$0.65

THE CASE FOR ADAPTIVE CONTROLS,
Advisory Group for Aeronautical Research and Development, Paris (France).
M. A. Ostgaard, E. B. Stear, and P. C. Gregory. Jul 62, 30p AGARD-406
NATO furnished. Presented at the Meeting of the Flight Mechanics Panel of AGARD (21st) Paris, 6-10 Jul 62.

Descriptors: (*Flight control systems, *Adaptive control systems), Linear systems, Feedback, Reentry vehicles, Reviews.

The paper attempts to show that adaptive control systems are practical, that they have lived up to expectations, and that they represent a significant advance over the conventional linear control systems. To do this the original problems which led to the initiation of applied research effort on adaptive flight control systems and the expected solutions from this research are reviewed along with certain pertinent historical aspects of linear feedback control theory. A typical flight control problem for re-entry vehicles is described, the conventional linear and the adaptive solutions to this problem are discussed in detail, and a practical mechanization of an adaptive flight control system for this application is described in some detail. Also some other promising adaptive techniques and their expected potential are discussed. (Author)
N63-19036 HC$3.00 MF$0.65

THE MODEL-CONTROLLED METHOD FOR THE DEVELOPMENT OF VARIABLE-STABILITY AIRCRAFT,
Advisory Group for Aeronautical Research and Development, Paris (France).
D. G. Gould. Jul 62, 40p AGARD-402
NATO furnished. Presented at Meeting of the Flight Mechanics Panel of AGARD (21st), in Paris, 6-10 Jul 1962.

Descriptors: (*Flight control systems, Design), Stability, Automatic pilots, Helicopters, Equations of motion, Mathematical models, Canada.
Identifiers: Closed loop control systems.

The application of a technique described as the model-controlled method (termed adaptive or semi-adaptive when applied to autopilots) for providing aircraft with variable stability and control characteristics is described. The development of a variable-stability helicopter using this method is treated in some detail to illustrate the significant design parameters and to demonstrate the advantages of the method over the more customary approach. The method allows for versatility in regard to simulation of complex equations of motion in that use may be made of standard computing components to construct an electrical analogue of the equations of motion of the simulated aircraft in a manner similar to that employed with ground

simulation. An accurate knowledge of the test aircraft stability derivatives and their variation with speed and altitude is not required since the test aircraft response is independent of significant variations in its own characteristics. In the case of application of the method to helicopters, in-flight adjustment of the control loop parameters is not required to ensure this independence over the full speed range of the helicopter. Use of the method for variable-stability fixed-wing aircraft may require in-flight adjustment of the control loop gain if the inherent control sensitivity changes by more than about 50% owing to speed and/or altitude changes during the test. (Author)
N63-19110 HC$3.00 MF$0.65

THE EXPERIMENTAL AND THEORETICAL DETERMINATION OF THE ELASTIC CHARACTERISTICS OF MODERN AIRFRAMES.
Advisory Group for Aeronautical Research and Development, Paris (France).
Richard H. Gallagher, and Ivan Rattinger. 1960, 71p AGARD-400
NATO Furnished. Presented at Structures and Materials Panel Meeting, Athens, Greece, 1960.

Descriptors: (*Airframes, Aeroelasticity), (*Wings, Aeroelasticity), Mathematical analysis, Stresses, Elasticity, Fuselages, Swept wings, Loading (Mechanics), Aerodynamic heating, Mathematical prediction, Hypersonic characteristics, Wing-body configurations, Theory.

The development of analytical and experimental procedures for the definition of the structural response of airframes designed for performance in flight regimes varying from subsonic to hypersonic is described. The results of numerous model and prototype wing tests are summarized and compared with predictions based on the use of available methods of low aspect ratio wing analysis. Tests were performed in both an unheated and heated environment with the purpose of providing data over a range of geometric parameters and elevated temperature conditions. Recent tests relating to a hypersonic wing-body combination are described. A survey is given of promising new techniques and future requirements. (Author)
N63-86348 HC$3.00 MF$0.65

THE PROBLEMS OF DESIGNING FOR THE TAKE-OFF AND LANDING OF HIGH SPEED AIRCRAFT.
Advisory Group for Aeronautical Research and Development, Paris (France).
A. N. Clifton. Jan 63, 19p AGARD-413
NATO furnished. Presented at Aircraft Take-Off and Landing Specialists' Meeting, Paris, 15-18 Jan 63.

Descriptors: (*Aircraft, Design), (*Take-off, Systems engineering), (*Aircraft landings, Systems engineering), Supersonic planes, Aviation safety, Aerodynamic loading, Aerodynamic control surfaces, Arresting gear.

The report discusses, in a general way, a number of well-known problems connected with the take-off and landing of high-speed aircraft. For example, wing loading, power loading, the use of high-lift devices, size and movement of the control surfaces, the pilot's view, the effect of slush, the use of arrester gear, protection against birds, and so on. The figure of 15 per cent of the total design and development cost is stated to be attributable to the take-off and landing processes. Data are given to show the effect of variable sweep and of various types of arresting systems on take-off and landing characteristics. (Author)
N64-13151 HC$3.00 MF$0.65

CONTROL POWER REQUIREMENTS OF VTOL AIRCRAFT QUARTERLY STATUS REPORT, 1 JUL. - 30 SEP. 1969.
California Univ., Davis. Dept. of Mechanical Engineering.
M. A. Hoffman. 30 Sep 69, 5p NASA-CR-106352, QSR-2
Contract NGR-05-004-051

Descriptors: *Flight control, *Power efficiency, *Requirements, *Systems analysis, *Vertical takeoff aircraft, Atmospheric circulation, Modal response, Pilot performance, Power limited spacecraft.

For abstract, see STAR 07 24.
N69-40030 HC$3.00 MF$0.65

DIGITAL AUTOPILOT DESIGN AND COMPUTER SIZING STUDY FINAL TECHNICAL REPORT.
Martin Marietta Corp., Denver, Colo.
P. G. Brabeck, J. H. Burrell, D. K. Houser, R. S. Jackson, and M. L. Salis. Sep 69, 264p NASA-CR-86246
Contract NAS12-2048
Electronics Research Center Date- Sep. 1969 Coll- 264 P Refs

Descriptors: *Automatic pilots, *Computer programs, *Digital techniques, *Flight control, *Requirements, *Spacecraft control, Equations of motion, Experimental design, Flow charts, Mathematical models, Systems engineering.

For abstract, see STAR 07 24.
N69-40045 HC$3.00 MF$0.65

HELIUM PRESSURIZATION SYSTEMS FOR LIQUID- METHANE FUEL IN SUPERSONIC TRANSPORTS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
For primary bibliographic entry see Field 21D.
For abstract, see STAR 07 24.
N69-40329 HC$3.00 MF$0.65

SIMPLIFIED PROCEDURES FOR ESTIMATING FLAPWISE BENDING MOMENTS ON HELICOPTER ROTOR BLADES. PART 2 - TABLES.
United Aircraft Corp., East Hartford, Conn. Research Labs.
A. J. Landgrebe. Oct 69, 92p NASA-CR-1441
Contract NAS1-7880
Coll- 92 P Refs

Descriptors: *Bending moments, *Mathematical tables, *Rotary wings, *Rotor blades, Elastic bending, Flapping hinges, Loading moments.

For abstract, see STAR 07 24.
N69-40359 HC$3.00 MF$0.65

MANUAL CONTROL OF UNSTABLE VEHICLES USING KINESTHETIC CUES.
Massachusetts Inst. of Tech., Cambridge. Man-vehicle Lab.
P. L. Noggle. Jun 69, 123p NASA-CR-106370, MV-69-4
Contract NGR-22-009-025

Descriptors: *Feedback control, *Manual control, *Operators (personnel), *Proprioception, *Research vehicles, *Self maneuvering units, Control equipment, Experimental design, Handles, Human factors engineering, Sensors.

For abstract, see STAR 07 24.
N69-40743 HC$3.00 MF$0.65

DETERMINATION OF THE SHAPE AND INERTIAL PROPERTIES OF AN ALL-FLEXIBLE PARAWING.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
B. B. Gloss. May 69, 65p NASA-TM-X-61907

Descriptors: *Center of gravity, *Lift drag ratio, *Moments of inertia, *Parawings, *Shapes, Aerodynamic characteristics, Flexible bodies, Low speed wind tunnels, Photogrammetry.

For abstract, see STAR 07 24.
N69-40928 HC$3.00 MF$0.65

EVALUATION OF A TECHNIQUE FOR DETERMINING AIRPLANE AILERON EFFECTIVENESS AND ROLL RATE BY USING AN AEROELASTICALLY SCALED MODEL.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
I. Abel. Nov 69, 32p NASA-TN-D-5538, L-6695
Contract 124-14-14-09-23

Descriptors: *Aircraft models, *Cargo aircraft, *Scale models, *Wind tunnel models, Ailerons, Jet aircraft, Roll.

For abstract, see STAR 07 24.
N69-40937 HC$3.00 MF$0.65

A DESIGN STUDY OF A METROPOLITAN AIR TRANSIT SYSTEM.
Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.
Aug 69, 301p NASA-CR-73362, SUDAAR-387
Contract NSR-05-020-151

Descriptors: *Air transportation, *Commercial aircraft, *Urban development, *Vertical takeoff aircraft, Airline operations, Costs, Helicopters, Noise reduction, Passengers, Terminal facilities.

For abstract, see STAR 07 24.
N69-41102 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF THE COOLING AND STRUCTURAL PERFORMANCE FOR THE HRE COWL LEADING EDGE.
Airesearch Mfg. Co., Los Angeles, Calif.
L. F. Jilly. 30 Jul 69, 89p NASA-CR-66843, AP-69-5347
Contract NAS1-6666

Descriptors: *Aircraft engines, *Cooling systems, *Cowlings, *Hypersonic speed, *Leading edges, *Nondestructive tests, Coolants, Flow distribution, Hastelloy (trademark), Heat transfer, Pressure drop.

For abstract, see STAR 07 24.
N69-41122 HC$3.00 MF$0.65

COOLANT PASSAGE FIN HEAT TRANSFER AND PRESSURE DROP PERFORMANCE.
Airesearch Mfg. Co., Los Angeles, Calif.
For primary bibliographic entry see Field 20M.
For abstract, see STAR 07 24.
N69-41183 HC$3.00 MF$0.65

1D. Aircraft Flight Control and Instrumentation

EXPERIMENTATION AND EVALUATION OF IMPROVED STALL WARNING EQUIPMENT.
Final rept.,
National Aviation Facilities Experimental Center Atlantic City N J
Robert J. Ontiveros. Dec 69, 28p* Rept no. NA-69-35 FAA-DS-69-15

Descriptors: (*Stall-warning indicators, Effectiveness), Human engineering, Auditory signals, Touch, Pilots, Flight simulators, Attention.
Identifiers: Evaluation.

A flight simulation project was conducted to determine the relative alerting efficacy of artificial aural and tactile warning signals for alerting pilots to an impending stall condition. Five pilots with current private flying experience participated as subjects in

the evaluation of a continuous warning horn signal, an interrupted warning horn signal, and tactile stickshakers with and without an aural (clacker-type) signal. While performing an intricate in-flight pattern task in a flight simulator, pilots were required to respond to aural and tactile warning signals if and when they were detected. The results show that a stickshaker warning signal is the most effective means of alerting a pilot (99 percent effective) followed by an interrupted horn (84 percent effective). The continuous or steady horn, currently used in most aircraft, was only 64 percent effective in alerting a pilot. The results also show that aural signals are least detected when the in-cockpit task or workload requires a high degree of pilot attention. (Author)
AD-697 941 HC$3.00 MF$0.65

AIRCRAFT METALS,
Foreign Technology Div Wright-Patterson AFB Ohio
Sh. Ya. Korovskii. 15 Aug 69, 272p Rept no. FTD-MT-24-391-68
Edited machine trans. of mono. Letayushchie Metally, Moscow, 1967 p1-254.

Descriptors: (*Aircraft, *Metals), Alloys, Physical properties, Manufacturing methods, Rocket motors, USSR.
Identifiers: Translations.

The book tells in interesting and easily understandable form about various metals used in aircraft, their properties, and production. A special chapter is devoted to the utilization of metals as a fuel for rocket engines and as sensitive elements in automation.
AD-698 107 HC$3.00 MF$0.65

INTEGRATION OF HIGH CONTRAST SOLID-STATE DISPLAYS AND ADVANCED CONTROL CIRCUITRY.
Final technical rept. Mar 66-May 67,
Lear Siegler, Inc., Grand Rapids, Mich. Instrument Div.
Baldwin J. Wierenga, Mark A. De Bono, and Zane A. Green. May 68, 50p GRR-67-1381 AFFDL-TR-67-196
Contract AF 33 (615)-3871
Distribution Limitation now Removed.

Descriptors: (*Altimeters, *Electroluminescence), Logic circuits, Integrated circuits, Silicon controlled rectifiers, Coding, Performance (Engineering), Feasibility studies, Manufacturing methods, Display systems, Colors.

A high-contrast, three-color electroluminescent lamp was combined with solid-state control circuitry, to form an altimeter display. The lamp was constructed in a hermetically sealed bezel to assure environmental protection. The control circuitry used DTL integrated circuits in combination with discrete SCR'S. The display accepted binary-coded decimal signals. The performance of the display proved the feasibility of combining a high-contrast display with solid-state control electronics to provide a complete solid-state display. (Author)
AD-835 375 HC$3.00 MF$0.65

VERTICAL INSTRUMENTS,
Advisory Group for Aeronautical Research and Development, Paris (France).
J. H. Kearns, and E. Warren. Jul 62, 30p AGARD-404
NATO furnished. Presented at Meeting of the Flight Mechanics Panel of AGARD (21st), Paris, 6-10 Jul 62.

Descriptors: (*Vertical indicators, Design), Display systems, Human engineering, Acceptability, Reliability.

The report contains a discussion of vertical scale instruments covering the historical facts which lead to their design through to their application. The point is made that vertical instruments represent the foundation of a new approach to the creation, design and development of displays. These instruments are now in use in over twelve squadrons and both pilot acceptance and reliability have been very good. Work is continuing on several parts of the Air Force Control-Display Program of which the effort on vertical instruments is a part. Work is being done on improved mechanization techniques, more comprehensive analysis methods for determining information requirements for human operators performing complex control tasks and advanced display designs to meet these requirements. (Author)
N63-19500 HC$3.00 MF$0.65

1E. Air Facilities

AIRFIELD PAVEMENT EVALUATION, USNALF CROWS LANDING, CALIFORNIA.
Technical note 5 Feb-3 Apr 68,
Naval Civil Engineering Lab., Port Hueneme, Calif.
D. J. Lambiotte, and J. A. Garcia. Apr 69, 220p NCEL-TN-1029
Distribution Limitation now Removed.

Descriptors: (*Runways, Pavements), (*Pavements, Structural properties), (*Landing fields, Pavements), Cements, Soil mechanics, Climatology, Test methods, Crack propagation, Wear resistance, Failure (Mechanics), Loading (Mechanics), Curve fitting, California.
Identifiers: Crows landing naval auxiliary landing field, Evaluation.

The evaluation of the pavement at the U. S. Naval Auxiliary Landing Field, Crows Landing, California is presented with the allowable gross load capacities of the runways, taxiways, and parking apron for single, dual, and dual-tandem wheel assembly aircraft. (Author)
AD-851 933 HC$3.00 MF$0.65

AN EXPERIMENTAL EVALUATION OF A NEW APPROACH TO CONCRETE OVERLAY.
Technical note May 68-Jun 69,
Naval Civil Engineering Lab., Port Hueneme, Calif.
J. P. Nielsen, and M. G. Katona. Jul 69, 50p NCEL-TN-1038
Distribution Limitation now Removed.

Descriptors: (*Runways, Pavements), (*Pavements, Design), Concrete, Flexible structures, Thickness, Flexural strength, Loading (Mechanics), Elasticity, Tensile properties, Strain (Mechanics), Crack propagation, Test methods, Programming (Computers), Asphalt.
Identifiers: *Pavement overlays, Evaluation.

The report describes and presents the results of a pavement research program in which theoretical and experimental studies were conducted relative to the problem of concrete overlay design for flexible pavements. The objective of this study was to investigate the use of concrete overlays thinner than the minimum 6-inch overlay now permitted. This study was first approached by conducting a thorough theoretical investigation to determine if any theoretical reasons existed which suggested that a minimum 6-inch overlay should be used. Elastic layered theory was used in the analysis. An experimental program was initiated in which a series of ten concrete overlays were placed over an existing flexible pavement. (Author)
AD-856 136 HC$3.00 MF$0.65

THE USE OF INSTRUMENTED PENETROMETERS TO DETERMINE SUBSOIL CONDITIONS AT INACCESSIBLE SITES.
Sandia Labs., Albuquerque, N. Mex.
For primary bibliographic entry see Field 8M.
PB-188 139 HC$3.00 MF$0.65

2. AGRICULTURE

2A. Agricultural Chemistry

THE APPLICATION OF NUCLEAR ENERGY TO AGRICULTURE.
Inter-American Inst. of Agricultural Sciences, Turrialba (Costa Rica).
For primary bibliographic entry see Field 2D.
For abstract, see NSA 23 23.
NYO-2043-194 HC$3.00 MF$0.65

PARTICIPATION OF TRACE ELEMENTS IN BIOCHEMICAL PROCESSES CONNECTED WITH BIOSYNTHESIS OF PROTEINS IN PLANTS,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
Ya. V. Peive. 17 Oct 69, 11p NIH-10-25-69
Trans. of Agrokhimiya (USSR) n2 p143-150 1969, by P. DePorte.

Descriptors: (*Plants (Botany), Metabolism), (*Proteins, Biosynthesis), (*Transition elements, Biochemistry), Nitrates, Nitrites, Ammonium compounds, Nitrogen, Molybdenum, Vanadium, Copper, Cobalt, Amino acids, Magnesium, Ribonucleic acids, Ribosomes, Zinc, Enzymes, USSR.
Identifiers: *Agricultural chemistry, *Nitrogen metabolism, *Nitrogen fixation, Trace elements.

Trace elements have varied effects on the biosynthesis of proteins, and this fact has a substantial influence on the yield and quality of agricultural crops. The report reviews this area and notes the following principal routes by which trace elements can participate in the nitrogen metabolism of plants: Trace elements take part in the biosynthesis of amino acids in plants, catalyzing the processes of assimilation of nitrate and ammonium nitrogen and the fixation of molecular nitrogen (the chief role here belongs to molybdenum, vanadium, copper, and cobalt); Metal ions are needed for the activation of amino acids and the formation of aminoacyl transport RNA (The principal role in this process belongs to the magnesium ions); RNA and protein molecules in ribosomes form a complex with bivalent cations, especially magnesium; The importance of molybdenum, copper, zinc, manganese, cobalt, and boron in the biosynthesis of protein may also depend on their involvement in nucleic-acid metabolism. (Author)
PB-187 972T HC$3.00 MF$0.65

BIOCHEMISTRY OF MOLYBDENUM,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
Ya. V. Peive. 17 Nov 69, 22p NIH-11-5-69
Trans. of Agrokhimiya (USSR) n1 p61-74 1969, by P. DePorte.

Descriptors: (*Molybdenum, Biochemistry), (*Plants (Botany), Biosynthesis), Nitrites, Nitrates, Reduction (Chemistry), Oxidoreductases, Nucleic acids, Nitrogen, Enzymes, Metabolism, Agriculture, Cobalt, Copper, USSR.
Identifiers: *Nitrogen metabolism, *Nitrogen fixation, *Agricultural chemistry, *Leguminous plants, Dehydrogenases, Flavine adenine dinucleotide, Adenosine pyrophosphates, Hydroxyamine.

The role of molybdenum in the biochemical processes of reduction of nitrates, nitrogen fixation, and the biosynthesis of proteins and nucleic acids is presented. It is shown that Mo elevates the activity of a number of enzymes: the oxidoreductases, connected with the nitrogen metabolism of plants. The action of Mo on plants increases the protein content, creating favorable conditions for the biosynthesis of nucleic acids. Schemes are presented for N2 fixation in the nodules of leguminous plants and the possible mechanisms of the

participation of Mo in physiological processes are discussed. (Author)
PB-187 973T HC$3.00 MF$0.65

2B. Agricultural Economics

FEDERAL PUBLIC LAND LAWS AND POLICIES RELATING TO INTENSIVE AGRICULTURE. VOLUME I. LEGAL STUDY.
Public Land Law Review Commission, Washington, D.C.

Oct 69, 524p*
Revision of report dated April 69. Prepared in cooperation with Kronick, Moskovitz, Tiedemann, and Girard, Contractors, Sacramento, Calif. See also Volume 2, PB-188 062.

Descriptors: (*Agriculture, *Economics), (*Water supplies, *Law), Money, Labor, Classification, Identification, Minerals, Irrigation systems, Patents, Control, Standards, Deserts, Reclamation, Budgets, Soils, Forestry, Feasibility studies, Management planning.
Identifiers: Homestead Acts.

Contents: Review and analysis of the existing system of laws and policies for the disposal of agricultural lands for intensive agricultural purposes, The homesteading of public lands under the General Homestead Laws, Special Homestead Laws, The Desert Land Act, The Indian Homestead and Allotment Laws, Acreage limitation policies, The classification laws and their effect on disposal of land for agricultural use, Agricultural use of federal land by lease or permit and a comparative review of laws governing the disposal or lease of agricultural lands by various states (Agricultural use of land under the Administrative Jurisdiction of various Federal Agencies by lease or permit, A comparative Review of Laws providing for the disposal or lease of agricultural lands by various States), Problems and alternatives.
PB-188 061 HC$3.00 MF$0.65

FEDERAL PUBLIC LAND LAWS AND POLICIES RELATING TO INTENSIVE AGRICULTURE. VOLUME II.
Final rept.
Public Land Law Review Commission, Washington, D.C.

Oct 69, 374p*
Revision of report dated 30 Apr 69. See also Volume 3, PB-188 063. Prepared in cooperation with South Dakota State Univ., Brookings. Agricultural Experiment Station.

Descriptors: (*Agriculture, *Economics), (*Water supplies, *Law), Intensity, Labor, Money, Irrigation systems, Costs, Rural areas, Production, Food, Feasibility studies, Fibers (Natural), Population, Selection, Management planning, Identification, Classification, United States Government.

Contents: Operation of the existing system of agricultural entry and use of the Federal Public lands; Effects of the existing system; Potential effects of additional agricultural output from public lands; Analysis of the existing system and some goals, issues and alternatives.
PB-188 062 HC$3.00 MF$0.65

FEDERAL PUBLIC LAND LAWS AND POLICIES RELATING TO INTENSIVE AGRICULTURE. VOLUME III. WORKING PAPERS: FEDERAL PUBLIC LANDS: THEIR DISPOSAL AND PERMITTED USE, 1934-67,
Public Land Law Review Commission, Washington, D.C.
Max Myers, and William Folkerts. Oct 69, 334p*
Revision of report dated 30 Apr 69. See also Volume 4, PB-188 064. Prepared in cooperation with South Dakota State Univ., Brookings. Agricultural Experiment Station.

Descriptors: (*Agriculture, *Economics), (*Water supplies, *Law), Terrain, Disposal, Patents, Costs, Reclamation, Control, Intensity, Statistical data, Deserts, Abundance, Classification, Identification, Management planning, Feasibility studies, United States Government.
Identifiers: Homestead acts.

The three working papers treat the related subjects of disposal and use of federal public lands for intensive agriculture. The first paper reports on land disposals in the 17 Western States with primary attention on those during 1934-1966. The second paper summarizes studies of selected cases particularly the administrative procedures and the actual experiences involved. The third paper describes the permitted use by private operators of lands retained in public ownership. (Author)
PB-188 063 HC$3.00 MF$0.65

FEDERAL PUBLIC LAND LAWS AND POLICIES RELATING TO INTENSIVE AGRICULTURE. VOLUME IV: WORKING PAPERS: FEDERAL PUBLIC LANDS: ECONOMICS OF FARM SIZE IN WESTERN UNITED STATES.
Public Land Law Review Commission, Washington, D.C.

Oct 69, 438p*
Revision of report dated 30 Apr 69. See also Volume 1, PB-188 061. Prepared in cooperation with South Dakota State Univ., Brookings. Agricultural Experiment Station.

Descriptors: (*Agriculture, *Economics), (*Water supplies, *Law), Budgets, Money, Cotton, Potatoes, Costs, Irrigation systems, Deserts, Employment, Production, Arizona, Wyoming, Idaho, Oregon, California, Montana, Washington (State).
Identifiers: Homestead acts.

Contents: What is an adequate income for a farm family; The theory: some simple examples of the effect of output on costs and returns; The homestead in the midwest--is it still adequate; Economics of size of irrigated farms; Economics of size of dryland farms.
PB-188 064 HC$3.00 MF$0.65

2C. Agricultural Engineering

NUCLEAR ENERGY CENTERS: THE PROBLEMS OF IMPLEMENTATION,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18L.
For abstract, see NSA 23 23.
ORNL-4295 HC$3.00 MF$0.65

2D. Agronomy and Horticulture

THE APPLICATION OF NUCLEAR ENERGY TO AGRICULTURE.
Annual rept.,
Inter-American Inst. of Agricultural Sciences, Turrialba (Costa Rica).
Carl C. Moh. 1 Jul 69, 113p
Contract AT (30-1)-2043

Descriptors: (*Agriculture, *Radiobiology), Plants (Botany), Physiology, Entomology, Genetics, Soils, Costa Rica.

For abstract, see NSA 23 23.
NYO-2043-194 HC$3.00 MF$0.65

USE OF SOLAR ENERGY FOR MASS CULTURE OF ALGAE.
Association Francaise pour L Etude Et le Developpement des Applications de L Energie Solaire, Paris.
For primary bibliographic entry see Field 6C.
For abstract, see STAR 07 24.
N69-40762 HC$3.00 MF$0.65

FRENCH EXPERIMENTS - CULTURE OF SPIRULINE OR BLUE ALGAE.
Institut Francais Du Petrole, Paris (France).
For primary bibliographic entry see Field 6C.
For abstract, see STAR 07 24.
N69-40765 HC$3.00 MF$0.65

NEW YORK STATE APPALACHIAN RESOURCE STUDIES. AGRICULTURE. PHASE I: INVENTORY.
New York State Coll. of Agriculture, Ithaca.
1969, 97P
Sponsored in part by the Department of Housing and Urban Development, Washington, D.C. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only. PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Agriculture, *New York), Economics, Soils, Classification, Milk, Birds, Animals, Fruits, Vegetables, Cereals, Forestry, Plants (Botany), Management planning.
Identifiers: Farm crops, *Appalachia, Counties, Greenhouses, Farm animals, Dairies.

The volume contains an inventory and preliminary analysis of the agricultural resources of the state's Appalachian area. This region - long known as the Southern Tier of New York State -- has excellent potentials for economic growth. (Author)
PB-187 985 HC$3.00 MF$0.65

ROADSIDE VEGETATION AND EROSION CONTROL. PART A: AGRONOMY. PART B: HORTICULTURE.
Alabama State Highway Dept., Montgomery.
For primary bibliographic entry see Field 13B.
PB-188 008 HC$3.00 MF$0.65

2E. Animal Husbandry

HEMATOPOIETIC NEOPLASMS OF SLAUGHTER ANIMALS,
Armed Forces Inst of Pathology Washington D C
George Migaki. 1969, 31p
Presented at the Symposium on Comparative Morphology of Hematopoietic Neoplasms, Washington, D. C. 11-12 Mar 68.
Availability: Pub. in National Cancer Inst. Monograph, n32 Hematopoietic Neoplasms p 121-152 n.d.

Descriptors: (*Neoplasms, Animals), (*Hemopoietic system, Neoplasms), Bovines, Swine, Goats, Equines, Pathology, Cancer, Histology.

Hematopoietic neoplasms observed in cattle, pigs, sheep, goats, and horses slaughtered in federally inspected establishments of the United States are: (a) malignant lymphomas; (b) thymomas; (c) mastocytomas; and (d) granulocytic sarcomas (malignant myelomas). Malignant lymphomas are the most frequently observed hematopoietic neoplasms of animals of all 5 species. Except for minor variations in distributions of neoplastic infiltrates, morphologic patterns are similar in all 5 species and resemble those seen in lymphomas of other animals and man. Thymomas occur in animals of all 5 species. They are encapsulated thoracic masses -- composed of mixtures of reticular and lymphocytic cells -- characteristically benign and rarely metastatic. Goats appear to have a relatively high incidence of thymomas compared to animals of the other 4 species: Mastocytomas, rare in slaughter animals were found only in cattle and pigs. Granulocytic sarcomas (malignant myelomas), also rare in slaughter animals, were observed only in cattle and pigs. Distribution of infiltrates was characteristic of granulocytic sarcoma rather than of leukemia. The outstanding characteristic was the green color of gross organs. (Author)
AD-698 004

LEPTOSPIROSIS IN BARBARY APES (MACACA SYLVANA),
Armed Forces Inst of Pathology Washington D C
R. J. Shive, S. S. Green, L. B. Evans, and F. M. Garner. Oct 69, 3p
Availability: Pub. in Jnl. of the American Veterinary Medical Association, v155 n7 p1176-1178, 1 Oct 69.

Descriptors: (*Leptospira, Infections), (*Monkeys, Diseases), Leptospira icterohaemorrhagiae, Serodiagnosis, Tissues (Biology), Primates, Histology, Pathology, Histological techniques.
Identifiers: Barbary apes, Macaca sylvana, Leptospirosis.

Three fatal cases of leptospirosis occurred in a colony of 26 Barbary apes (Macaca sylvana) at the National Zoological Park in Washington, D. C. Clinical signs were not observed in any cagemates nor in any other primate species at the zoo. Serologic studies indicated the presence of previous infection by serotype icterohaemorrhagiae in 2 of the cagemates. Spirochetes were observed in tissues of all fatally affected apes. Serogroup icterohaemorrhagiae bacteria were isolated by direct bacteriologic culture of tissues and by hamster inoculation from one of the apes. (Author)
AD-698 005

SYSTEMIC CRYPTOCOCCOSIS IN 2 MONKEYS,
Armed Forces Inst of Pathology Washington D C
F. M. Garner, D. F. Ford, and M. A. Ross. Oct 69, 6p
Availability: Pub. in Jnl. of the American Veterinary Medical Association, V155 n7 p1163-1168, 1 Oct 69.

Descriptors: (*Cryptococcus, Infections), (*Monkeys, Diseases), Diagnosis, Histology, Infections, Lungs, Brain, Pathology, Veterinary medicine.

Cryptococcosis was diagnosed in a rhesus monkey (Macaca mulatta) and in a Formosan monkey (Macaca cyclopis). The disease was not suspected clinically in either case, and the diagnoses were made only after gross and histologic examinations of necropsy specimens. There was generalized systemic infection in both, but gross lesions were apparent in only 2 organs -- lungs and brain. Histologically, the infection was characterized by a mild granulomatous inflammatory reaction in association with numerous cryptococci. The discovery of typical cryptococcic granulomas deep in brain parenchyma was of particular interest. (Author)
AD-698 008

CLINICAL LABORATORY VALUES OF BEAGLE DOGS,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 6C.
AD-698 218

NEW YORK STATE APPALACHIAN RESOURCE STUDIES. AGRICULTURE. PHASE I: INVENTORY.
New York State Coll. of Agriculture, Ithaca.
For primary bibliographic entry see Field 2D.
PB-187 985 HC$3.00 MF$0.65

2F. Forestry

NEW YORK STATE APPALACHIAN RESOURCE STUDIES. AGRICULTURE. PHASE I: INVENTORY.
New York State Coll. of Agriculture, Ithaca.
For primary bibliographic entry see Field 2D.
PB-187 985 HC$3.00 MF$0.65

PRODUCTION, PRICES, EMPLOYMENT, AND TRADE IN NORTHWEST FOREST INDUSTRIES.
Pacific Northwest Forest and Range Experiment Station, Portland, Oreg.
For primary bibliographic entry see Field 5C.
PB-188 204 HC$3.00 MF$0.65

DEVELOPMENT OF SOME RADIOISOTOPE PROCEDURES FOR MEASURING WATER MOVEMENT IN TREES,
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
Peyton W. Owston, James L. Smith, and Howard G. Halverson. 22 Apr 69, 55p
Contract AT (49-11)-2773

Descriptors: (*Trees, Evapotranspiration), (*Evapotranspiration, Tracer studies), Radioactive isotopes, Phosphorus.

For abstract, see NSA 23 23.
TID-25136 HC$3.00 MF$0.65

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

PERIOD CHANGES IN ECLIPSING VARIABLES. PART 1 - PHOTOELECTRIC OBSERVATIONS OF XY LEONIS.
Osservatorio Astronomico Di Collurania, Teramo (Italy).
R. De Carlo, and P. Tempesti. Aug 68, 10p
Seri- Its Note E Comunicazioni 45

Descriptors: *Periodic variations, *Refractometers, *Tables (data), Astronomical photography, Astronomical photometry, Constellations, Light (visible radiation), Stellar luminosity, Variable stars.

For abstract, see STAR 07 24.
N69-40225 HC$3.00 MF$0.65

AUTOMATED STELLAR PROPER MOTION MEASURING MACHINE MONTHLY PROGRESS REPORT, AUG. - SEP. 1969.
Minnesota Univ., Minneapolis.
14 Oct 69, 35p NASA-CR-106348
Contract NSR-24-005-062

Descriptors: *Automation, *Measuring instruments, Coding, Engineering drawings, Scanning.

For abstract, see STAR 07 24.
N69-40493 HC$3.00 MF$0.65

A LONG-RANGE PROGRAM IN SPACE ASTRONOMY - POSITION PAPER OF THE ASTRONOMY MISSIONS BOARD.
National Aeronautics and Space Administration, Washington, D. C.
R. O. Doyle. Jul 69, 316p NASA-SP-213

Descriptors: *Astronomy, *Nasa programs, *Space programs, Cosmic rays, Crab nebula, Project management, Space probes.

For abstract, see STAR 07 24.
N69-41150 HC$3.00 MF$0.65

3B. Astrophysics

THE ELECTRIC FIELD IN THE SOLAR CORONAL EXOSPHERE AND THE SOLAR WIND,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Hari K. Sen. 1969, 9p Rept no. AFCRL-69-0532
Availability: Pub. in Jnl. of The Franklin Institute, v287 n6 p451-456 Jun 69.

Descriptors: (*Solar corona, Electric fields), (*Solar wind, Protons), Plasma sheath, Hydrostatics, Voltage.

The solar coronal exosphere (fixed at a level where the mean free path is comparable with the scale height) is shown to act like the sheath in a laboratory discharge that builds up an excess positive charge and electric field. Equality of flux for the charged particles (protons and electrons) at the exosphere is assumed. The exospheric electric potential (for a coronal temperature of 1,000,000 deg. K) is found to be about 325 V, which makes the protons virtually weightless. The exospheric sheath potential accelerates the thermal protons to a velocity of 258 km/sec with which they coast to the earth. The proton density in transit varies approximately as the inverse square law, and is 3/cc near the earth. Higher velocities and densities are obtained for higher coronal temperatures. An estimate of the exospheric transition region is obtained by applying the hydrodynamic theory of ambipolar diffusion in a gravitational field to the 'observed' coronal density distribution. (Author)
AD-698 065

EXPLORATION OF GRAVITATIONAL ANOMALIES OF PLANETS FROM ORBITING VEHICLES,
Grumman Aircraft Engineering Corp Bethpage N Y
Paul H. Savet. 18 Sep 68, 31p Rept no. RE-366J
IDEP-347.00.00.00-K4-64
Availability: Pub. in Proceedings of the 'Advanced Space Experiments' meeting of the American Astronautical Society, Ann Arbor, Mich., p303-331, 16-18 Sep 68.

Descriptors: (*Planets, *Gravity), Scientific satellites, Potential theory, Tensor analysis, Sensors.
Identifiers: *Gravity anomalies.

The tensor character of a fictitious potential function is introduced as a close approximation to a locally tangent actual potential function to be explored. It is shown that this fictitious potential can be locally explored analytically and experimentally and that it provides all the data necessary for the definition of gravitational features, including local anomalies of a planet. The anomalies can be derived by simultaneously measuring appropriately directed horizontal gradients of gravity which yield, among other things, the local differential curvature of the equipotential. This is the only parameter capable of defining and locating the anomalies encountered. Besides supplying this information, the differential curvature depends on the anomalies alone and is completely independent of the over-all planetary mass and gravitational features. The instrumentation necessary for this exploration cannot be conceived along the conventional design lines of accelerometers based on the elastic suspension of a proof mass. Instead, an entirely new sensor is suggested, one operating on the free proof mass principle. This 'seismic' instrument, described and analyzed here, does not require calibration, operates entirely independently of the size of the proof mass, and represents an optimized figure of merit in terms of sensitivity over the square of its time constant of response. (Author)
AD-698 066

SOLAR MODULATION OF GALACTIC COSMIC RAYS, 1,
California Univ San Diego La Jolla Dept of Applied Physics and Information Science
L. A. Fisk, and W. I. Axford. 7 Jul 69, 15p AROD-5133:258-P
Contract DA-31-124-ARO (D)-257, Grant NGR-05-009-081
Revision of report dated 17 Mar 69.
Availability: Pub. in Jnl. of Geophysical Research Space Physics, v74 n21 p4973-4986, 1 Oct 69.

Descriptors: (*Cosmic rays, Modulation), (*Solar wind, Interactions), Space environmental conditions, Partial differential equations, Approximation (Mathematics), Particle trajectories.
Identifiers: *Galactic cosmic rays, Solar modulation, Fokker-Planck equation.

The equations governing cosmic-ray modulation allowing for convection, diffusion, and energy changes are approximated with simpler, more manageable equations that describe the particle behavior in a limited energy range. (Author)
AD-698 101

QUASAR MODELS AND NEBULAE.
Status rept. 1 Jan-31 Oct 69,
Cornell Univ Ithaca N Y Center for Radiophysics and Space Research
T. Gold. Nov 69, 8p Rept no. CRSR-355
Contract N00014-67-A-0077-0007

Descriptors: (*Extraterrestrial radio waves, Radiofrequency pulses), Nebulae, Galaxies, Supernovae, Cosmic rays, Radiofrequency spectroscopy, Infrared spectroscopy, Mathematical models.
Identifiers: *Radio sources (Astronomy), Pulsars, Quasars, Neutron stars.

The document is a status report for work in the areas of pulsating radio sources, quasars, and radio galaxies.
AD-698 206 HC$3.00 MF$0.65

TIME-SPLITTING OF SOLAR RADIO BURSTS,
Oslo Univ (Norway) Inst of Theoretical Astrophysics
Oeystein Elgaroey. 1 Nov 68, 9p Rept no. Scientific-14 (82) AFCRL-69-0506
Contract F61052-67-C-0070
Availability: Pub. in Astrophysical Letters, v3 p39-42 1968.

Descriptors: (*Extraterrestrial radio waves, Solar radiation), Electromagnetic pulses, Magnetic storms, Solar corona, Norway.
Identifiers: *Solar radio emission.

Solar radio bursts often occur in pairs. It is suggested that this splitting may result from propagation via two different magneto-ionic modes. (Author)
AD-698 211

THE ABUNDANCE OF BERYLLIUM IN THE SOLAR ATMOSPHERE,
Oslo Univ (Norway) Inst of Theoretical Astrophysics
Oeivind Hauge, and Oddbjoern Engvold. 11 Oct 68, 9p Rept no. Scientific-13 (81) AFCRL-69-0500
Contract F61052-67-C-0070
Availability: Pub. in Astrophysical Letters, v2 p235-238 1968.

Descriptors: (*Solar atmosphere, Beryllium), (*Beryllium, Abundance), Solar spectrum, Spectra (Visible+ ultraviolet), Line spectrum, Lithium, Norway.
Identifiers: Photosphere.

A beryllium abundance of log N (Be)= 0.96 is obtained for the solar atmosphere. This value is more than a factor of ten less than usually assumed. The implications of the increased Li/Be ratio are discussed. (Author)
AD-698 212

ASTROGEOLOGIC STUDIES ANNUAL PROGRESS REPORT, 1 JUL. 1966 - 1 OCT. 1967.
Geological Survey, Washington, D. C.

Dec 67, 74p NASA-CR-106349
NASA ORDER R-66

Descriptors: *Lunar geology, *Lunar maps, *Lunar photographs, *Photogrammetry, *Photointerpretation, Astronomical observatories, Environment simulation, Lunar topography, Mapping, Spacecraft instruments, Telescopes.

For abstract, see STAR 07 24.
N69-40015 HC$3.00 MF$0.65

A MODEL OF THE MARTIAN HAZE.
Bellcomm, Inc., Washington, D. C.
E. N. Shipley. 14 Jul 69, 62p NASA-CR-106346, TR-69-235-1
Contract NASW-417

Descriptors: *Image contrast, *Mariner 4 space probe, *Mars atmosphere, *Mathematical models, *Spaceborne photography, Atmospheric models, Brightness, Light transmission.

For abstract, see STAR 07 24.
N69-40090 HC$3.00 MF$0.65

THE TOPSIDE IONOSPHERE OF VENUS AND ITS INTERACTION WITH THE SOLAR WIND.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
S. J. Bauer, R. E. Hartle, and J. R. Herman. Oct 69, 10p NASA-TM-X-63717
Contract X-615-69-459

Descriptors: *Mariner space probes, *Solar wind, *Venus (planet), Graphs (charts), Ionosphere, Magnetic fields.

For abstract, see STAR 07 24.
N69-40113 HC$3.00 MF$0.65

ANOMALOUS TEMPORAL BEHAVIOR OF NP0532.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
S. S. Holt, and R. Ramaty. Oct 69, 10p NASA-TM-X-63716, X-63716
Subm- Submitted for Publication

Descriptors: *Discontinuity, *Optical reflection, *Pulsars, *Radio transmission, Abnormalities, Gravitational fields, Measurement, Satellite perturbation, Time dependence.

For abstract, see STAR 07 24.
N69-40174 HC$3.00 MF$0.65

REPORT OF 1967 SUMMER "TYCHO" MEETING.
Minnesota Univ., Minneapolis. Dept. of Electrical Engineering.
21 Jul 67, 196p NASA-CR-106301, TG-31
Contract NSR-24-005-047
Conf- Meeting Held At Hanover, New Hampshire, 20 Jun. - 21 Jul. 1967

Descriptors: *Atmospheric composition, *Conferences, *Mars (planet), *Planetary surfaces, *Venus (planet), Infrared spectroscopy, Microwaves, Occultation, Planetary landing, Radar cross sections, Water.

For abstract, see STAR 07 24.
N69-40313 HC$3.00 MF$0.65

NASA SPACE VEHICLE DESIGN CRITERIA-ENVIRONMENT. METEORID ENVIRONMENT MODEL - 1969 (NEAR EARTH TO LUNAR SURFACE).
National Aeronautics and Space Administration, Washington, D. C.
B. G. Cour-palais. Mar 69, 35p NASA-SP-8013

Descriptors: *Astronomical models, *Comets, *Interplanetary space, *Meteoroid concentration, *Meteoroid hazards, Earth atmosphere, Environment simulation, Lunar atmospheres, Meteorites, Meteoritic damage.

For abstract, see STAR 07 24.
N69-40326 HC$3.00 MF$0.65

SOLAR ACTIVITY, 27-DAY VARIATION AND LONG TERM MODULATION OF COSMIC RAY INTENSITY.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
For primary bibliographic entry see Field 4A.
For abstract, see STAR 07 24.
N69-40412 HC$3.00 MF$0.65

THE USE OF SPECTRAL ANALYSIS IN DESCRIBING LUNAR SURFACE ROUGHNESS.
Geological Survey, Washington, D. C.
W. Rozema. Dec 68, 37p NASA-CR-106336
NASA ORDER W-12388
Seri- Its Interagency Report- Astrogeol. 12

Descriptors: *Lunar roving vehicles, *Lunar topography, *Spectrum analysis, *Surface roughness, Autocorrelation, Density, Statistical analysis.

For abstract, see STAR 07 24.
N69-40421 HC$3.00 MF$0.65

UPPER LIMITS OF X-RAY FLUXES FROM SOME QUASARS.
Bologna Univ. (Italy). Inst. of Physics.
D. Brini, F. Frontera, and F. Fuligni. Jul 69, 11p

Descriptors: *Balloon sounding, *Quasars, *Radiation detectors, *Upper atmosphere, *X rays, Error analysis, Geiger counters, Telemetry, X ray astronomy.

For abstract, see STAR 07 24.
N69-40717 HC$3.00 MF$0.65

ALPHA PARTICLE EMISSIVITY OF THE MOON - AN OBSERVED UPPER LIMIT.
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
J. A. Van Allen, and R. S. Yeh. Jul 69, 25p NASA-CR-106452, REPT-69-38
Contracts NGL-16-001-002, NONR-1509/06/

Descriptors: *Alpha particles, *Explorer 35 satellite, *Lunar soil, Basalt, Earth planetary structure, Estimates, Uranium 238.

For abstract, see STAR 07 24.
N69-40925 HC$3.00 MF$0.65

METHOD FOR ESTIMATING THE ELECTRICAL CONDUCTIVITY OF THE LUNAR INTERIOR.
Bellcomm, Inc., Washington, D. C.
J. L. Blank, and W. R. Sill. 22 Sep 69, 36p NASA-CR-106456, TR-69-103-7-4
Contract NASW-417

Descriptors: *Electrical resistivity, *Estimating, *Interlayers, *Lunar topography, Electric fields, Magnetic fields, Magnetometers, Solar wind.

For abstract, see STAR 07 24.
N69-40950 HC$3.00 MF$0.65

A RADIALLY INHOMOGEOUS MOON IN A PLANE ELECTROMAGNETIC FIELD FINAL REPORT.
California Univ., Berkeley. Space Sciences Lab.
B. D. Fuller, and S. H. Ward. Sep 69, 29p NASA-CR-73382
Contract NAS2-5242

Descriptors: *Electromagnetic fields, *Inhomogeneity, *Lunar topography, *Moon, *Surface layers, Celestial sphere, Electrical properties, Low frequencies, Mathematical models, Numerical analysis.

For abstract, see STAR 07 24.
N69-41025 HC$3.00 MF$0.65

DIFFERENCES BETWEEN PROPOSED APOLLO SITES - FAR INFRARED EMISSIVITY EVIDENCE.
Bellcomm, Inc., Washington, D. C.
A. F. Goetz, and L. A. Soderblom. 9 Jun 69, 13p
NASA-CR-106401, TR-69-340-2
Contracts NASW-417, NGL-02-002-003

Descriptors: *Emission spectra, *Infrared spectra, *Lunar topography, *Spectrum analysis, Lunar landing sites, Oxygen, Silicon.

For abstract, see STAR 07 24.
N69-41171 HC$3.00 MF$0.65

AUTOMATIC SPACEBORNE SOLAR FLARE DETECTION.
Bellcomm, Inc., Washington, D. C.
R. K. Agarwal. 25 Jul 69, 95p NASA-CR-106402, TM-69-1031-2
Contract NASW-417

Descriptors: *Automatic control, *Solar flares, *Spaceborne photography, *Warning systems, Astronomical telescopes, Detection, Digital computers, Image tubes.

For abstract, see STAR 07 24.
N69-41173 HC$3.00 MF$0.65

GAS DENSITY DETECTOR FOR USE IN SPACE.
Virginia Polytechnic Inst., Blacksburg. Dept of Physics.
W. K. Meshejian, W. K. Ramamurti, W. P. Trower, and D. S. Wollan. Oct 69, 62p NASA-CR-66834
Contract NAS1-8145
Subm- Submitted for Publication

Descriptors: *Electric current, *Gas density, *Meteoroids, *Proportional counters, Glow discharges, Hole distribution (electronics), Monitors, Performance tests, Radioactive isotopes.

For abstract, see STAR 07 24.
N69-41184 HC$3.00 MF$0.65

A COMPREHENSIVE MASTER PLAN, TOWN OF MARION, WAYNE COUNTY, NEW YORK. VOLUME 2: MASTER PLAN AND IMPLEMENTATION.
New York State Office of Planning Coordination, Buffalo.
Sep 69, 161p
Prepared in cooperation with Herbert H. Smith Associates, Rochester, N. Y.

Descriptors: (*Urban planning, *New York), Commerce, Civil engineering, Education, Sanitary engineering, Recreation, Housing, Population, Economics, Budgets.
Identifiers: *Marion (New York).

Contained in the report are the second and third phases of Marion's Comprehensive Plan: The Master Plan and the Implementation. The Master Plan portion generally assimilates the data from the Basic Studies and makes a series of recommendations in the form of four specific Plans. The first, The Land Use Plan, describes the proposed distribution of various land uses and some of the characteristics desired of the land use pattern. The second, The Circulation Plan, indicates proposals for improving existing streets and highways as well as proposals for the construction of new roadways. The third, The Community Facilities Plan, provides the necessary public and private facilities and utilities in proper quantity and location to serve the future land use pattern. The fourth, The Financial Plan, indicates the way in which Marion can finance the improvements recommended in other portions of the Plan in a manner suited to the financial resources of the Town. The last portion of the Comprehensive Plan is the Implementation. This phase outlines the various steps which Marion must take to insure that their various plans are carried out properly. The first step, the proposed zoning ordinance, insures that desirable land uses are established for the various segments of the Town. The second step, the proposed subdivision regulations, insures that the residential development within the community is properly designed and that adequate provisions for needed public improvements are made. The third step, the Capital Improvements Program, recommends a systematic scheduling of the construction and acquisition of Capital items over a period of several years. (Author)
PB-188 019 HC$3.00 MF$0.65

3C. Celestial Mechanics

THE HALOING EFFECT OF THE THIRD INTEGRAL,
Boeing Scientific Research Labs Seattle Wash Mathematics Research Lab
Andre Deprit, and Jacques Henrard. Nov 69, 36p
Rept nos. Mathematical Note-629, D1-82-0930

Descriptors: (*Celestial mechanics, Integrals), Transformations (Mathematics), Orbital trajectories, Topology.
Identifiers: Lie transformation, Periodic orbits.

Whether Contopoulos' galactic system is separable (unlikely) or not (likely), the fact is that there exists a vicinity of the equilibrium in which numerical integration of high accuracy cannot separate the system from its image through a Birkhoff's normalization of high order. To all practical purposes, Stellar Dynamics is then justified in pretending that the model is, in that region, structured by a so-called third integral. (Author)
AD-698 174 HC$3.00 MF$0.65

ECLIPSE PHENOMENA -- A BOOK REVIEW,
Rand Corp Santa Monica Calif
G. F. Schilling. Dec 69, 5p Rept no. P-4268

Descriptors: (*Lunar eclipses, Reviews), (*Solar eclipses, Reviews), (*Stellar eclipses, Reviews), Radio astronomy, Twilight.
Identifiers: Book reviews, Photometry.

The document is a review of the book Eclipse Phenomena in Astronomy by F. Link. The author of this book is a Czechoslovakian astronomer who has been associated with both Eastern and Western research in astronomy and space exploration.
AD-698 188 HC$3.00 MF$0.65

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

STATIONARY MODEL OF WIND DISTRIBUTION WITH HEIGHT IN THE ATMOSPHERIC BOUNDARY LAYER,
Foreign Technology Div Wright-Patterson AFB Ohio
V. L. Krivosheev. 2 Sep 69, 17p Rept no. FTD-HT-23-417-69
Edited trans. of Gidrometeorologicheskii Nauchno-Issledovatelskii Tsentr SSSR. Trudy, n16 p68-79 1968, by M. Olaechea.

Descriptors: (*Atmosphere, Boundary layer), (*Wind, Distribution), Atmosphere models, Equations of motion, Approximation (Mathematics), Weather forecasting, Thickness, Hydrodynamics, USSR.
Identifiers: Translations.

An approximation method consisting of expansion of the hydrodynamic equation for the boundary layer in terms of small parameters is used to solve the problem of wind distribution with height in the case of curvilinear isobars (a family of second order curves). The reduced curvatures of the isobars are considered as small parameters. The equation of steady motion of an incompressible fluid in the boundary layer of the earth in the case of a constant mixing coefficient is given. Graphs of the plane divergence for the boundary layer of a thickness of 1.5 km for linear and nonlinear cases are presented. (Author)
AD-697 896 HC$3.00 MF$0.65

REENTRY VEHICLE DISPERSION DUE TO ATMOSPHERIC VARIATIONS.
Institute for Defense Analyses Arlington Va Science and Technology Div
For primary bibliographic entry see Field 16C.
AD-697 925 HC$3.00 MF$0.65

CAPTURE, LOSS AND IONIZATION CROSS SECTIONS OF IONS AND NEUTRAL PARTICLES.
Pittsburgh Univ Pa
For primary bibliographic entry see Field 7D.
AD-697 963 HC$3.00 MF$0.65

CHEMICAL CONCENTRATIONS OF POLLUTANT LEAD AEROSOLS, TERRESTRIAL DUSTS, AND SEA SALTS IN GREENLAND AND ANTARCTIC snow strata,
Scripps Institution of Oceanography La Jolla Calif
For primary bibliographic entry see Field 8L.
AD-697 964 HC$3.00 MF$0.65

PROGRESS REPORT, JUNE 15 - DECEMBER 15, 1969,
Wayne State Univ Detroit Mich Research Inst for Engineering Sciences
Richard Marriott. Dec 69, 11p
Contract F04701-69-C-0230, ARPA Order-1389

Descriptors: (*Carbon monoxide, *Upper atmosphere), (*Exhaust gases, *Rockets), Infrared radiation, Oxygen, Molecular energy levels, Vibration.
Identifiers: *Rocket exhaust, Atom molecule interactions Chemical reaction mechanisms, *Collison cross sections.

Brief summary reports are given in two areas of research. Work was initiated to calculate the vibrational excitation cross sections for the collision system: CO+ O yields CO*+ O - kinetic energy. The mechanisms responsible for the generation of high altitude infrared emission from rocket plumes were studied. (Author)
AD-697 967 HC$3.00 MF$0.65

MEASUREMENTS OF THE THORON CONCENTRATION OF THE LOWER ATMOSPHERE IN RELATION TO THE EXCHANGE IN THIS REGION.
Rept. no. 4 (Final) May 68-Jul 69,
Technische Hochschule Aachen (West Germany) Forschungsstelle Fuer Geophysik Und Meteorologie
Hans Israel, M. Horbert, and C. de La Riva. Aug 69, 181p
Contract DAJA37-68-C-0967

Descriptors: (*Atmospheric motion, Tracer studies), (*Radon, Transport properties), Radioactive isotopes, Ionization chambers, Heat transfer, Tables, West Germany.
Identifiers: Thoron.

The following theoretical (Part I) and experimental (Part II) studies have been carried out: I. Theory: The exact mathematical formulations of the eddy viscosity and the eddy diffusity were derived in the frame of mixing length concept. This allowed clarification of the repeatedly discussed mutual interdependency of these quantities, which is relevant to comparison of their fundamental transport mechanism. Moreover, several basic relationships that are relevant to the understanding of the parameters entering the treatise and useful for the evaluation of respective data measured were elaborated. A theoretical justification is given of

the confinement of the measurements to the use of the emanations as tracers for the atmospheric eddy transport. Special labor was spent on the development, design and testing of two new equipments: The transportable arrangement measuring atmospheric mass and momentum transfer, and the (still) stationary arrangement measuring atmospheric eddy conductivity, correcting directly distortions by atmospheric humidity. A device evaluating the measured thoron profiles directly into relevant and final data by electronic means has been designed and manufactured.
AD-698 034 HC$3.00 MF$0.65

NEUTRAL ATMOSPHERE WAVE GENERATION BY THE EQUATORIAL ELECTROJET,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
W. C. Knudsen. 23 Apr 69, 2p
Revision of report dated 12 Mar 69.
Availability: Pub. in Jnl. of Geophysical Research, Space Physics, v74 n16 p4191-4192, 1 Aug 69. No copies furnished.

Descriptors: (*Ionospheric disturbances, Electromagnetic waves), Aurorae, Microbarometric waves, Energy, Magnetic storms, Tropical regions, Correlation techniques, Polar regions.
Identifiers: Equatorial electrojet, Internal gravity waves.

The concentration of ionospheric current at the equator in the form of the equatorial electrojet and the temporal perturbations thereof may be expected to generate internal gravity waves at low latitude. The purpose of this paper is to estimate the amplitude of the waves relative to that generated in the polar regions. (Author)
AD-698 053

SATELLITE MEASUREMENTS OF AURORAL ULTRAVIOLET AND 3914-A RADIATION,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
E. G. Joki, and J. E. Evans. 28 May 69, 10p
Contract Nonr-3398 (00)
Revision of report dated 18 Mar 69.
Availability: Pub. in Jnl. of Geophysical Research, Space Physics, v74 n19 p4677-4686, 1 Sep 69.

Descriptors: (*Aurorae, Ultraviolet radiation), (*Ultraviolet radiation, Measurement), Scientific satellites, Ultraviolet spectrophotometers, Charged particles, Electron density, Upper atmosphere, Photomultipliers.
Identifiers: Far ultraviolet radiation, Ultraviolet spectrometers.

Satellite measurements of auroral ultraviolet and 3914-A radiation were made November 9-11, 1965, as part of a coordinated program of luminosity, particle precipitation, and ion and electron number density measurements. Auroral ultraviolet radiation in the 1230- to 1840-A region was observed on most satellite crossings of the auroral zones and was seen to occur with charged-particle precipitation. At those times when the auroral 3914-A intensity was sufficiently great to permit its observation despite the high moonlight background, good spatial correlation with the ultraviolet radiation was found. At the peaks of the auroral forms the intensities of the 3914-A radiation and of detected ultraviolet were comparable. (Author)
AD-698 054

SATELLITE OBSERVATIONS OF THE AVERAGE PROPERTIES OF AURORAL PARTICLE PRECIPITATIONS: LATITUDINAL VARIATIONS,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
R. D. Sharp, D. L. Carr, and R. G. Johnson. 23 May 69, 13p
Revision of report dated 24 Mar 69. Sponsored in part by Office of Naval Research, Washington, D. C., and Defense Atomic Support Agency, Washington, D. C.
Availability: Pub. in Jnl. of Geophysical Research, Space Physics v74 n19 p4618-4630, 1 Sep 69.

Descriptors: (*Aurorae, Charged particles), (*Charged particles, Measurement), Electron density, Protons, Scientific satellites, Upper atmosphere, Diurnal variations, Ionization, Detectors.
Identifiers: Radiation belts.

The results of a statistical study of the auroral particle data from satellite 1963-42A have shown some interesting systematics in the averaged properties of the low-energy particles. When data from 216 traversals of the auroral zones were averaged over 1 degree intervals of invariant latitude, a statistically significant 'soft' electron zone was found at high latitudes at local times near midnight and noon. Both the averaged pitch-angle distributions and energy spectral distributions of the auroral electrons were found to vary systematically with latitude. The averaged energy distributions in the 'hard'zone hardened dramatically with decreasing latitude on the dayside, in reasonably good agreement with expectations assuming they were precipitated from a quasi-trapped parent population that was drifting in L under conservation of the first two adiabatic invariants. This process could be a source for energetic outer belt electrons. On the nightside, the dependence on latitude was less pronounced, but there was evidence for a maximum in the spectral hardness near the center of the zone. The averaged angular distributions were almost isotropic near the center of the zone and became highly anisotropic in the wings, with the maximum flux at high pitch angles. The auroral proton precipitation zone consisted of a single peak that exhibited a diurnal variation of 8 1/2 degrees. (Author)
AD-698 055

TRIGGERING OF HYDROMAGNETIC 'WHISTLERS' BY SFERICS,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
A. C. Fraser-Smith, and K. R. Roxburgh. 26 Nov 68, 4p
Availability: Pub. in Planetary Space Science, v17 p1310-1312 1969. No copies furnished.

Descriptors: (*Whistlers, Sources), Atmospherics, Reflection, Lightning, Magnetosphere, Very low frequency, Charged particles, California.
Identifiers: Sferics.

Since 1962, the regularly structured geomagnetic micropulsations which occur within the Pc 1 frequency range (0.2-5 Hz) have aroused continued interest. Commonly known as pearls, or hydromagnetic (hm) emissions, the micropulsations exhibit a repetitive rising fine structure when displayed on a frequency-time spectrogram. It has been shown that the fine structure elements observed at geomagnetically conjugate stations are 180 degrees out of phase, i.e., they alternate between the two stations. Another important characteristic of the micropulsations is a gradual increase of signal strength to some maximum level followed by an equally gradual decay. These observations enable a theory to be formulated for the generation mechanism of the signals. (Author)
AD-698 060

THE ELECTRIC FIELD IN THE SOLAR CORONAL EXOSPHERE AND THE SOLAR WIND,
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 3B.
AD-698 065

ION COMPOSITION BELOW 3000 KM DERIVED FROM ION WHISTLER OBSERVATIONS,
Defence Research Telecommunications Establishment Ottawa (Ontario) Radio Physics Lab
D. J. McEwen, and R. E. Barrington. 1969, 9p
DRTE-2997
Availability: Pub. in Space Research VIII p396-404 n.d. No copies furnished.

Descriptors: (*Whistlers, Analysis), (*Upper atmosphere, Ions), Protons, Orbital trajectories, Scientific satellites, Radio receivers, Oxygen, Helium, Hydrogen, Abundance, Measurement, Canada.
Identifiers: Alouette 2 satellite.

Several hundred ion whistlers recorded by the VLF receiver in the Alouette II satellite during its first year in orbit have been analyzed. These whistlers were observed over nearly the full height range of the satellite from 500 km to 3000 km, and at invariant latitudes up to 67 degrees. They have provided considerable information on the relative abundance of hydrogen, helium and oxygen ions in this region. (Author)
AD-698 096

ELECTRON-ION AND ION-ION DISSOCIATIVE RECOMBINATION OF OXYGEN. II. ION-ION RECOMBINATION,
California Univ San Diego La Jolla Dept of Physics
For primary bibliographic entry see Field 7D.
AD-698 099

TURBULENCE AND VERTICAL CURRENTS IN THE BOUNDARY LAYER OF THE ATMOSPHERE,
Foreign Technology Div Wright-Patterson AFB Ohio
P. A. Vorontsov. 20 Aug 69, 287p Rept no. FTD-HT-23-1332-68
Edited trans. of mono. Turbulentnost i Vertikalnye Toki v Pogranichnom Sloe Atmosfery, Leningrad, 1966 p1-296.

Descriptors: (*Atmospheric motion, Turbulent boundary layer), Air mass analysis, Radiosondes, Atmospheric sounding, Convection (Atmospheric), Balloons, Heat transfer, Mountains, Clear air turbulence, Diffusion, Flow fields, Textbooks, USSR.
Identifiers: Translations.

The primary purpose of this book is to summarize the results of aerological investigations of air-flow structure in the atmospheric boundary layer, which have been carried out by the staff of the Main Geophysical Observatory (GGO) both at its Voyekovo facility near Leningrad and on numerous field projects in various parts of the Soviet Union. The book is intended for the use of specialists working on a wide range of theoretical and practical problems related to atmospheric physics- construction engineering, problems related to atmospheric physics- construction engineering, aviation, agriculture, weather forecasting, air pollution, wind-power engineering- and as a reference for research workers and graduate students in meteorology, climatology, and atmospheric physics. (Author)
AD-698 106 HC$3.00 MF$0.65

VARIATIONS IN EXOSPHERIC DENSITY DURING 1967-8, AS REVEALED BY ECHO 2.
Technical rept.,
Royal Aircraft Establishment Farnborough (England)
G. E. Cook. Jun 69, 26p Rept no. RAE-TR-69127

Descriptors: (*Exosphere, Density), Magnetic storms, Solar disturbances, Orbital trajectories, Satellites (Artificial), Solar radiation, Atmosphere models, Great Britain.
Identifiers: Echo 2 satellite, *Atmospheric density.

Values of atmospheric density at heights near 1000 km have been obtained from the orbit of Echo 2 during 1967 and 1968. The results clearly show the existence in the exosphere of 27-day variations associated with the rotation of the sun and also correlation with geomagnetic disturbances. The semi-annual variation in the exosphere is again apparent, and has now been traced from before solar minimum in 1964 up to and probably past the current solar maximum; the magnitude of the semi-annual density variation shows no definite dependence on the level of solar activity. The irregular year-to-year variations in the effect are similar to those at lower heights, being large at all heights at the same time. The variation in the exosphere exceeds the magnitude expected on the basis of variations at lower heights at dates before July 1966 and after April 1968, but is of the expected magnitude between these dates. (Author)
AD-698 176 HC$3.00 MF$0.65

IONOSPHERIC AERODYNAMICS,
Joint Publications Research Service, Washington, D.C.
A. V. Gurevich, L. P. Pitaevskii, and V. V. Smirnova. 1 Dec 69, 72p
Trans. of Uspekhi Fizicheskikh Nauk (USSR) v99 n1 p3-49 1969.

Descriptors: (*Ionosphere, *Aerodynamics), Charged particles, Ions, Plasma medium, Gas flow, Wedges, Cylindrical bodies, Disks, Electric fields, Stability, Rockets, Satellites (Artificial), USSR.

Contents: Basic equations and similarity law; Flow around a halfplane; Flow of a plasma containing a mixture of ions around a halfplane; Flow around a wedge; Flow around the rounded edge of a body; Flow around a plate; Flow around a cylinder; Flow around a disc; The effect of an electric field on the ion motion; Flow around sharply elongated bodies; Instability of the plasma in the wake of a body; Potential of the body surface; Numerical calculations taking into account the finiteness of the Debye radius; Experimental investigation of the disturbed zone in the vicinity of rockets and satellites in the ionosphere.
JPRS-49350 HC$3.00 MF$0.65

ON THE METHOD OF DETERMINING THE MAGNETOSPHERIC ELECTRIC FIELD BY MEANS OF PARTICLE FLUX MEASUREMENTS.
Rome Univ. (Italy). Inst. of Physics.
A. Egidi, and G. Pizzella. 10 Jun 69, 12p
Seri- Its Nota Interna 224

Descriptors: *Electric fields, *Magnetosphere, *Proton flux density, Geoelectricity, Lines of force, Magnetospheric proton density, Satellite instruments, Stationary orbits.

For abstract, see STAR 07 24.
N69-40039 HC$3.00 MF$0.65

A LIMB RADIANCE CALCULATION APPROACH FOR MODEL ATMOSPHERES CONTAINING HORIZONTAL GRADIENTS OF TEMPERATURE AND PRESSURE.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
R. E. Davis. Oct 69, 37p NASA-TN-D-5495
Contract 125-17-07-08-23

Descriptors: *Atmospheric models, *Carbon dioxide, *Spectral bands, Earth albedo, Numerical analysis, Pressure gradients, Temperature gradients, Terrestrial radiation.

For abstract, see STAR 07 24.
N69-40055 HC$3.00 MF$0.65

IONOSPHERIC RESEARCH - THE INTERACTION OF AN OBLIQUELY INCIDENT P-POLARIZED PLANE ELECTROMAGNETIC WAVE WITH A HOT PLASMA HALF- SPACE AND PLASMA SLAB.
Pennsylvania State Univ., University Park. Dept. of Electrical Engineering.
P. E. Bolduc. 15 Sep 69, 146p NASA-CR-106345, SR-338
Contract NGL-39-009-003

Descriptors: *Electromagnetic radiation, *Half spaces, *Plasma slabs, *Plasma-electromagnetic interaction, *Polarization (waves), Fourier series, High temperature plasmas, Kinetic theory, Thermodynamics.

For abstract, see STAR 07 24.
N69-40077 HC$3.00 MF$0.65

ATMOSPHERIC TEMPERATURE CHANGES ASSOCIATED WITH HIGH ALTITUDE TURBULENCE.
Eastern Air Lines, Inc., Miami, Fla.
P. W. Kadlec. Jul 69, 27p NASA-CR-106204
Contract NAS4-1392

Descriptors: *Atmospheric temperature, *Clear air turbulence, *Stratosphere, B- 70 aircraft, Temperature gradients, Thermal instability.

For abstract, see STAR 07 24.
N69-40091 HC$3.00 MF$0.65

CONTRIBUTION TO THE STUDY OF THE VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE.
Contributions A l'Etude de La Repartition Verticale de l'Ozone Atmospherique
Paris Univ. (France).
J.-P. Bancarel. 27 Feb 69, 99p
Lang- in French Spon- Sponsored Jointly By Cnes and Delegation Gen. Rech. Sci. Et Tech.

Descriptors: *Balloon sounding, *Ozone, *Rocket sounding, *Upper atmosphere, *Vertical distribution, Absorption spectra, Atmospheric composition, Radiosondes, Solar radiation, Weather forecasting.

For abstract, see STAR 07 24.
N69-40164 HC$3.00 MF$0.65

A STUDY OF LOW ENERGY COSMIC RAYS AT 1 AU.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
J. H. Kinsey. Sep 69, 159p NASA-TM-X-63710, X-611-69-396

Descriptors: *Alpha particles, *Data reduction, *Particle telescopes, *Proton flux density, *Satellite instruments, Cosmic rays, Imp, Solar flares, Spectrum analysis.

For abstract, see STAR 07 24.
N69-40198 HC$3.00 MF$0.65

MEAN DIURNAL VARIATIONS OF THE TOTAL IONOSPHERIC ELECTRON CONTENT.
Variations Diurnes Moyennes des Contenus Totaux D'electrons de l'Ionosphere
Paris Univ. (France). Laboratoire de Physique de l'Atmosphere.
A. Vassy. 1968, 91p PUBL-1968-3
Lang- in French

Descriptors: *Diurnal variations, *Ionospheric electron density, Graphs (charts), Latitude, Magnetic fields, Periodic variations.

For abstract, see STAR 07 24.
N69-40238 HC$3.00 MF$0.65

KIRUNA GEOPHYSICAL DATA - DATA SUMMARY 68/7-9, JULY - SEPTEMBER 1968.
Kiruna Geophysical Observatory (Sweden).
L. Liszka. 1968, 70p

Descriptors: *Polar regions, *Sweden, *Upper atmosphere, Auroras, Ionosphere, Magnetic variations, Micropulsations, Solar radiation, Spectrophotometry, Tables (data).

For abstract, see STAR 07 24.
N69-40239 HC$3.00 MF$0.65

ON THE EQUILIBRIUM OF COSMIC GRAINS.
Royal Inst. of Tech., Stockholm (Sweden). Plasma Physics Div.
B. Lehnert. 16 Aug 69, 17p REPT-69-26

Descriptors: *Charged particles, *Cosmic plasma, *Heat balance, Condensing, Cosmic gases, Cosmic rays, Cosmology, Electrons, Evaporation rate, Gas density, Grains, Ion recombination, Ionized gases, Ions, Matter (physics), Plasma temperature, Solar radiation.

For abstract, see STAR 07 24.
N69-40351 HC$3.00 MF$0.65

SOLAR ACTIVITY, 27-DAY VARIATION AND LONG TERM MODULATION OF COSMIC RAY INTENSITY.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
V. K. Balasubrahmanyan, and D. Venkatesan. Sep 69, 9p NASA-TM-X-63715
Contract X-611-69-438

Descriptors: *Cosmic rays, *Periodic variations, *Solar activity, Linearity, Protons, Solar flares.

For abstract, see STAR 07 24.
N69-40412 HC$3.00 MF$0.65

SEASONAL TRANSITIONS IN THE THERMAL STRUCTURE OF THE MESOSPHERE AT HIGH LATITUDES.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
W. S. Smith, and J. S. Theon. Sep 69, 16p NASA-TM-X-63702, X-621-69-393
Subm- Submitted for Publication

Descriptors: *Acoustic propagation, *Grenades, *Mesosphere, *Thermodynamic properties, Stratosphere, Summer, Winter.

For abstract, see STAR 07 24.
N69-40456 HC$3.00 MF$0.65

USE OF PASSIVE SATELLITES FOR MEASURING STRATOSPHERIC ABSORPTION IN THE NEAR ULTRAVIOLET.
Utilisation des Satellites Passifs pour La Mesure de l'Absorption Stratospherique Dans le Proche Ultraviolet
Paris Univ. (France).
P. Rigaud. 1968, 61p
Lang- in French

Descriptors: *Earth atmosphere, *Near ultraviolet radiation, *Optical density, *Vertical distribution, Atmospheric attenuation, Eclipses, Ozone, Solar radiation.

For abstract, see STAR 07 24.
N69-40469 HC$3.00 MF$0.65

NOCTURNAL LUMINESCENCE AT VALENSOLE DURING IQSY - SKY ISOPHOTES OF 5577 ANGSTROM GREEN LINE.
Luminescence Nocturne A Valensole Pendant l'Aisc - Isophotes Du Ciel de La Raie Verte 5577 Angstrom
Paris Univ. (France). Laboratoire de Physique de l'Atmosphere.
M. Bizien, and A. Vassy. 1968, 101p PUBL-1968-13
Lang- in French

Descriptors: *Graphs (charts), *International quiet sun year, *Isophotes, *Night sky, *Sky brightness, Fabry-perot interferometers, France, Luminescence, Periodic variations, Photometers, Polar coordinates.

For abstract, see STAR 07 24.
N69-40510 HC$3.00 MF$0.65

KIRUNA GEOPHYSICAL DATA - DATA SUMMARY DECEMBER 1968.
Kiruna Geophysical Observatory (Sweden).
L. Liszka. Dec 68, 32p

Descriptors: *Polar regions, *Sweden, *Upper atmosphere, Auroras, Ionosphere, Magnetic variations, Solar radiation, Spectrophotometry, Tables (data).

For abstract, see STAR 07 24.
N69-40558 HC$3.00 MF$0.65

OZONE CONTENT AT GROUND LEVEL AT PORT AUX FRANCAIS (KERGUELEN ISLAND), 1961 - 1966.
Concentration de l'Air en Ozone Au Niveau Du Sol A La Station de Port Aux Francais (Iles Kerguelen), 1961-1966
Paris Univ. (France). Laboratoire de Physique de l'Atmosphere.
A Vassy. 1968, 39p PUBL-1968-5
Lang- in French

Descriptors: *Atmospheric composition, *Indian ocean, *Ozone, Islands, Partial pressure, Periodic variations, Tables (data).

For abstract, see STAR 07 24.
N69-40731 HC$3.00 MF$0.65

MEASUREMENT OF NIGHT SKY LUMINESCENCE AT VALENSOLE DURING IQSY - GREEN LINE 5577 ANGSTROM.
Mesure de La Luminescence Nocturne A Valensole Pendant l'Aisc - Raie Verte 5577 Angstrom
Paris Univ. (France). Laboratoire de Physique de l'Atmosphere.
M. Bizien, and A. Vassy. 1968, 13p PUBL-1968-2
Lang- in French

Descriptors: *France, *International quiet sun year, *Night sky, *Sky brightness, Fabry-perot interferometers, Luminescence, Periodic variations, Photometers, Tables (data).

For abstract, see STAR 07 24.
N69-40732 HC$3.00 MF$0.65

ATMOSPHERIC DENSITIES MEASURED BY THE EXPLORER 17 DENSITY GAUGES - ANALYSIS OF ERRORS AND THEIR EFFECTS UPON THE MEASUREMENTS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
R. Horowitz, and G. P. Newton. Nov 69, 36p
NASA-TN-D-5447

Descriptors: *Atmospheric composition, *Atmospheric density, *Error analysis, *Explorer 17 satellite, Chemical reactions, Nitrogen, Oxygen.

For abstract, see STAR 07 24.
N69-40924 HC$3.00 MF$0.65

KIRUNA GEOPHYSICAL DATA - DATA SUMMARY 68/4-6, APRIL - JUNE 1968.
Kiruna Geophysical Observatory (Sweden).
L. Liszka. 1968, 67p

Descriptors: *Polar regions, *Sweden, *Upper atmosphere, Auroras, Ionosphere, Magnetic variations, Solar radiation, Spectrophotometry, Tables (data), Wave propagation.

For abstract, see STAR 07 24.
N69-41106 HC$3.00 MF$0.65

MEASUREMENTS OF PRECIPITATED 1-20 KE V PROTONS AND ELECTRONS DURING A BREAKUP AURORA.
TRW Systems, Redondo Beach, Calif. Space Sciences Lab.
W. Bernstein, G. T. Inouye, N. L. Sanders, and R. L. Wax. 27 Jan 69, 29p NASA-CR-106476, TRW-06484-6008-R0-00
Contract NASW-1474

Descriptors: *Auroras, *Electrons, *Photometers, *Protons, Electron probes, Flux density, Graphs (charts), Hydrogen, Nike-tomahawk rocket vehicle, Spectrometers.

For abstract, see STAR 07 24.
N69-41121 HC$3.00 MF$0.65

BIBLIOGRAPHY OF ATOMIC AND MOLECULAR PROCESSES FOR JANUARY-JUNE 1965.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 23 23.
ORNL-AMPIC-4 HC$3.00 MF$0.65

4B. Meteorology

SURVEY OF THE POSSIBILITY OF SHORT-RANGE RADIO PREDICTIONS FROM METEOROLOGICAL DATA.
Institute for Telecommunication Sciences Boulder Colo
For primary bibliographic entry see Field 17B.
AD-697 884 HC$3.00 MF$0.65

STATIONARY MODEL OF WIND DISTRIBUTION WITH HEIGHT IN THE ATMOSPHERIC BOUNDARY LAYER.
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 4A.
AD-697 896 HC$3.00 MF$0.65

FORECAST METHODS FROM SATELLITE PHOTOGRAPHS.
Final rept. 1968-69
Institute for Storm Research Inc Houston Tex
John C. Freeman, Pieter Feteris, Sam Rosenberg, Keith Veigas, and Troxel Ballou. Jun 69, 66p Rept no. ISR-45
Contract N62306-68-C-0289

Descriptors: (*Weather forecasting, Tropical regions), (*Meteorological satellites, Aerial photographs), Atmosphere models, Jet streams (Meteorology), Atmospheric motion, Clouds, Mathematical models, Simulation, Meteorological charts, Synchronous satellites, Sequential photography, Moisture, Numerical methods and procedures, Pacific Ocean.
Identifiers: ATS satellites, Spaceborne photography.

Two models of atmospheric flow, 'compensation' and 'moist over-compensation' are found to be useful in the study of tropical weather in conventional and satellite observations. A numerical weather prediction model simulating important physical processes in the low latitudes is developed to test the feasibility of using ATS information to infer future weather distribution. Diagnostic studies using ATS films and conventional synoptic weather maps describe the weather situations in the Central North Pacific in terms of the theoretical models. Results of the prediction experiment and future use of ATS type data in numerical prediction models are discussed and application recommended. Appendix A gives a description of one method of following cloud motion in satellite photographs. (Author)
AD-697 940 HC$3.00 MF$0.65

VISIBILITY IMPROVEMENT GRAPHS: A SYNOPTIC CLIMATOLOGICAL FORECAST AID.
Technical paper,
Weather Wing (4th) Ent AFB Colo Aerospace Sciences Div
Robert C. Sabin. Nov 69, 31p Rept no. 4WW-TP-69-5

Descriptors: (*Weather forecasting, Fog), (*Visibility, Graphics), Probability, Convection (Atmospheric), Wind, Ceiling.
Identifiers: Advection, *Climatology forecast aids.

The paper describes a new technique for producing a useful synoptic climatological forecast aid which is different from the conventional climatological product. Data is limited to a specific weather element (radiation fog) associated with a specific synoptic weather regime. Thus, it is probably the first true synoptic climatological forecast tool. Its superiority over aids which do not take the synoptic pattern into account is clearly evident. (Author)
AD-697 960 HC$3.00 MF$0.65

THE CHESAPEAKE BAY INSTITUTE WAVE FOLLOWER.
Johns Hopkins Univ Baltimore Md Chesapeake Bay Inst
For primary bibliographic entry see Field 8C.
AD-697 968 HC$3.00 MF$0.65

METEOROLOGISCHE ABHANDLUNGEN BAND XCV HEFT 3. DAILY AND MONTHLY NORTHERN HEMISPHERE 30-MILLIBAR-SYNOPTIC WEATHER MAPS OF THE YEAR 1968. PART III. JULY-SEPTEMBER.
Quarterly technical status rept. no. 3, Jul-Sep 68,
Freie Universitaet Berlin (West Germany) Institut Fuer Meteorologie Und Geophysik
Dietrich Just, Barbara Kriester, Karin Labitzke, Renate Lenschow, and Karin Petzoldt. Oct 69, 108p
Contract DAJA37-68-C-1104
See also Volume 96, Number 2, AD-692 950. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproduction will be made in black and white only.
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Meteorological charts, Northern Hemisphere), (*Meteorological parameters, *Upper atmosphere), Periodic variations, Atmospheric temperature, Barometric pressure, Atmospheric motion, West Germany.
Identifiers: Synoptic weather maps.

The reports are published quarterly and present 30 mb maps, day by day, throughout 1961 to present. Height and temperature data are plotted on each chart and appropriate contours are drawn. A discussion of the stratospheric circulation for each quarter is included. Each volume also contains mean monthly maps and charts of changes in the means from month to month, for the appropriate months. (Author)
AD-698 015 HC$3.00 MF$0.65

MEASUREMENTS OF THE THORON CONCENTRATION OF THE LOWER ATMOSPHERE IN RELATION TO THE EXCHANGE IN THIS REGION.
Technische Hochschule Aachen (West Germany) Forschungsstelle Fuer Geophysik Und Meteorologie
For primary bibliographic entry see Field 4A.
AD-698 034 HC$3.00 MF$0.65

NEW OBSERVATIONS OF ANOMALOUS CLOUD LINES.
Air Force Cambridge Research Labs L G Hanscom Field Mass
John H. Conover. 10 Feb 69, 3p Rept no. AFCRL-69-0536

Availability: Pub. in Jnl. of Atmospheric Sciences, v26 n5 pt.2 p1153-1154 Sep 69.

Descriptors: (*Clouds, Anomalies), Aerial photographs, Stratus clouds, Meteorological satellites, Drops, Convection (Atmospheric), Nucleation, Atmospheric temperature, Humidity, Ships (Nonmilitary).
Identifiers: Supersaturation, Spaceborne photography.

Recent aircraft observations of extensive cloud lines are given. These observations prove their formation behind ocean-going vessels, a previous hypothesis proposed by the author from the analysis of satellite cloud photography and associated surface weather conditions. (Author)
AD-698 050

A CALCULATED ANALYSIS OF CERTAIN PARAMETERS OF A SLANT TRANSPARENCY METER,
Army Foreign Science and Technology Center Washington D C
V. A. Markelov. 6 Nov 69, 12p Rept no. FSTC-HT-23-707-69
Trans. of Nauchno-Issledovatelskii Institut Gidrometeorologicheskogo Priborostroeniya. Trudy (USSR) n18 p81-86 1968.

Descriptors: (*Meteorological instruments, Visibility), (*Visibility, Measurement), Meters, Illumination, Light transmission, Optical equipment components, Mathematical analysis.
Identifiers: Translations, Transparency.

A design-analytical analysis covers the selection of two parameters of a slant transparency meter: the secondary light source height and the angles between the optical axes of a quantum optical generator and the receiver. The analysis reveals that with an increased secondary light source height and a decreased angle between the optical axes, slant illumination is decreased. (Author)
AD-698 078 HC$3.00 MF$0.65

STATISTICAL STRUCTURE OF AEROLOGIC FIELD ANOMALIES OVER NORTH AMERICA,
Army Foreign Science and Technology Center Washington D C
R. L. Kagan, and K. M. Lugina. 14 Nov 69, 32p
Rept no. FSTS-HT-23-007-70
Trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n228 p98-120 1968.

Descriptors: (*Atmospheric temperature, Anomalies), Weather stations, Statistical data, Mountains, Gravity, Accuracy, Errors, Measurement, United States, Canada, USSR.
Identifiers: Translations, Winter, *Geopotential.

For making an objective analysis of aerologic field anomalies it is necessary to accumulate data on their statistical structure. Until recently few such data were available due to the difficulty of making the required computations manually. The availability of electronic computers has now made it possible to compute such characteristics. As the initial material we used data on the mean monthly values of geopotential and temperature at the 500-mb isobaric surface for the ten years from 1956 to 1965 as published by the United States Weather Bureau. The authors selected 48 aerologic stations located in the United States and Canada. Using these data for both elements for each month separately the authors computed the mean values and the mean square deviations for each station and also the spatial autocorrelation functions to distances of about 6,000 km. (Author)
AD-698 079 HC$3.00 MF$0.65

MONTHLY CHARTS OF MEAN, MINIMUM, AND MAXIMUM SEA SURFACE TEMPERATURE OF THE NORTH PACIFIC OCEAN.
Naval Oceanographic Office Washington D C
For primary bibliographic entry see Field 8J.
AD-698 125 HC$3.00 MF$0.65

VERIFICATION OF MAZEIKA'S METHOD OF THERMOCLINE DEPTH PREDICTION FOR THE NORTHEAST PACIFIC OCEAN.
Naval Postgraduate School, Monterey, Calif.
For primary bibliographic entry see Field 8J.
AD-803 657 HC$3.00 MF$0.65

PAINE FIELD TERMINAL FORECAST REFERENCE FILE. VOLUME II,
Weather Squadron (35th), Paine Field, Wash. Detachment 5.
Arthur T. Safford, III. Dec 67, 292p
Distribution Limitation now Removed.

Descriptors: (*Air Force operations, *Weather forecasting), (*Climatology, Washington (State)), Puget sound, British Columbia, Pacific Ocean, Oregon, California, Meteorological charts, Meteorological parameters, Landing fields, Air mass analysis.

The volume supplements the original report, 'Paine Field Terminal Forecast Reference File' published in June 1967. It is devoted to further studies on typical weather patterns in the Pacific Northwest and contains seasonal checklists and other forecasting aids applicable in this area. (Author)
AD-826 895 HC$3.00 MF$0.65

PROGRESS REPORT NO. 42 ON COMPUTING AND APPLIED MATHEMATICS FOR THE HALF YEAR JANUARY 1-JUNE 30, 1969. TECHNICAL SUMMARY FOR TASK I AND V ALSO ADMINISTRATIVE AND FINANCIAL SUMMARY FOR ENTIRE CONTRACT.
New York Univ., N.Y. AEC Computing and Applied Mathematics Center.
For primary bibliographic entry see Field 12A.
For abstract, see NSA 23 23.
NYO-1480-122 HC$3.00 MF$0.65

THE INFLUENCE OF AERODYNAMICS IN WIND POWER DEVELOPMENT,
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 10B.
N63-80507 HC$3.00 MF$0.65

CLIMATOLOGICAL OBSERVATIONS MONTHLY BULLETIN, JUL. 1969.
Observations Climatologiques
Institut Royal Meteorologique de Belgique, Brussels.
1969, 15P
Lang- in French and Dutch

Descriptors: *Belgium, *Climatology, *Tables (data), Atmospheric moisture, Atmospheric pressure, Atmospheric temperature, Precipitation (meteorology), Solar radiation, Storms (meteorology), Wind (meteorology).

For abstract, see STAR 07 24.
N69-40150 HC$3.00 MF$0.65

OZONE CONTENT AT GROUND LEVEL AT VAL- JOYEUX (YVELINES) AND PORT AUX FRANCAIS (KERGUELEN ISLAND), 1967.
Concentration de l'Air en Ozone Au Niveau Du Sol Aux Stations de Val-joyeux (Yvelines) Et de Port Aux Francais (Iles Kerguelen), Annee 1967
Paris Univ. (France). Laboratoire de Physique de l'Atmosphere.
A. Vassy. 1969, 16p PUBL-1969-1
Lang- in French

Descriptors: *Atmospheric composition, *France, *Ozone, Partial pressure, Periodic variations, Tables (data).

For abstract, see STAR 07 24.
N69-40508 HC$3.00 MF$0.65

THE PENETRATION OF TORNADO-LIKE VORTICES INTO THE BOUNDARY LAYER NUMERICAL EXPERIMENTS FINAL SCIENTIFIC REPORT, 1 FEB. 1966 - 31 MAY 1969.
Technische Hochschule, Darmstadt (West Germany). Inst. Fuer Meteorologie.
A. Szillinsky, and F. Wippermann. 30 Jun 69, 106p
AD-691879, AFCRL-69-0321
Contract AF 61/052/-932

Descriptors: *Atmospheric turbulence, *Tornadoes, *Turbulent diffusion, *Vortices, Atmospheric pressure, Boundary value problems, Mathematical models, Numerical analysis.

For abstract, see STAR 07 24.
N69-40768 HC$3.00 MF$0.65

CLIMATIC DATA OF THE DUMONT D' URVILLE STATION.
Donnees Climatiques de La Station Dumont D'urville
France. Direction de La Meteorologie Nationale, Paris.
J. Chesneau, and J. Heuzey. May 69, 68p
Lang- in French Seri- Its Monograph No. 72

Descriptors: *Climatology, *Surface temperature, *Tables (data), *Wind velocity measurement, Atmospheric pressure, Atmospheric temperature, France, Fronts (meteorology), Geodetic coordinates.

For abstract, see STAR 07 24.
N69-41013 HC$3.00 MF$0.65

AN EXPERIMENTAL INVESTIGATION OF TAYLOR'S HYPOTHESIS FOR ATMOSPHERIC BOUNDARY LAYER FLOW.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
For primary bibliographic entry see Field 22D.
For abstract, see STAR 07 24.
N69-41055 HC$3.00 MF$0.65

CLIMATOLOGY OF THE BALE- MULHOUSE AIRPORT.
Climatologie de l'Aerodrome de Bale-mulhouse
France. Direction de La Meteorologie Nationale, Paris.
R. Bubeck, P. Leydier, J. Mouriaux, and A. Tasson. Jun 69, 57p
Lang- in French Seri- Its Monograph No. 70

Descriptors: *Airports, *Climatology, *France, *Tables (data), *Topography, Atmospheric circulation, Cloud cover, Low visibility, Meteorological charts, Temperature distribution, Wind pressure.

For abstract, see STAR 07 24.
N69-41262 HC$3.00 MF$0.65

ON COMPARATIVE RATINGS OF FORECASTERS.
Technical memo.,
Weather Bureau, Fort Worth, Tex. Southern Region Headquarters.
George T. Gregg. Oct 69, 18p WBTM-SR-48

Descriptors: (*Weather forecasting, Performance (Human)), (*Scientific personnel, Weather forecasting), Correlation techniques, Meteorological parameters.
Identifiers: *Weather forecasters.

Comparisons were made of eight weather forecasters from records since the official beginning of precipitation probability forecasting, December 1965, and the beginning of the FP/NMC comparison (precipitation and temperature) in March 1966. It was concluded that no outstanding individual strengths or weaknesses were apparent from objective verification data.
PB-188 039 HC$3.00 MF$0.65

METEOROLOGICAL CHARACTERISTICS OF THE COLD JANUARY 1969 IN HAWAII.
Technical memo.,
Weather Bureau, Honolulu, Hawaii. Pacific Region.
Richard I. Sasaki. Nov 69, 21p WBTM-PR-7

Descriptors: (*Meteorological phenomena, Atmospheric temperature), (*Atmospheric temperature, Hawaii), Freezing, Barometric pressure, Meteorological charts, Atmospheric motion, Dew point.
Identifiers: Honolulu (Hawaii).

A description is presented of the meteorological conditions that attended the unusually chilly weather experienced in Hawaii during January 1969. (Author)
PB-188 040 HC$3.00 MF$0.65

AEROBALLISTIC, PERFORMANCE, WIND EFFECTS AND PAYLOAD IMPACT DISPERSION ANALYSES AND FLIGHT TEST DATA FOR THE SINGLE-STAGE SANDHAWK ROCKET SYSTEM,
Sandia Labs., Albuquerque, N. Mex.
For primary bibliographic entry see Field 19G.
For abstract, see NSA 23 23.
SC-DR-69-291 HC$3.00 MF$0.65

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

SYSTEMS ANALYSIS AND COST EFFECTIVENESS. PARTS I-VI.
Adjutant General's Office (Army), Washington, D.C.

Apr 64, 91p
Distribution Limitation now Removed.

Descriptors: (*Systems engineering, Decision making), Costs, Effectiveness, Analysis, Operations research, Management planning, Army procurement, Management engineering.
Identifiers: Systems analysis.

Systems analysis is a systematic, quantitative approach to the complex military-economic problems encountered in the defense program. It is limited by the quality and subjectiveness of the measurable factors put into each alternative. An increased army systems analysis effort can assist in attaining solutions to army problems and improving the justification of related army programs.
AD-450 411 HC$3.00

BUSIM. DYNAMIC INVENTORY MANAGEMENT SIMULATOR,
Ships Parts Control Center, Mechanicsburg, Pa.
R. W. Remsburg, and R. F. Hess. Jul 63, 123p
ALRAND-40
Distribution Limitation now Removed.

Descriptors: (*Inventory control, Programming (Computers)), Stock level control, Management planning, Management control systems, Mathematical models, Predictions.
Identifiers: BUSIM computer program.

BUSIM is a computer program consisting basically of a series of routines logically associated with such inventory factors as review period, order point, order quantity, risk of stock-out over lead time, safety stock level and demand forecasting. By properly combining and sometimes modifying these routines a wide number of inventory control systems may be simulated and evaluated.
AD-488 283 HC$3.00 MF$0.65

ADVANCED MATERIEL SYSTEMS PLANNING.
Case Inst of Tech Cleveland Ohio Operations Research Group
For primary bibliographic entry see Field 12B.
AD-697 971 HC$3.00 MF$0.65

IDEAS FOR MANAGERS: A DIGEST OF ACTIONS FOR INCREASING EFFICIENCY AND ECONOMY IN THE MANAGEMENT OF DEFENSE ACTIVITIES.
Assistant Secretary of Defense (Installations and Logistics) Washington D C

1969, 168P*
Availability: Paper copy available from Superintendent of Documents, GPO, Washington, D. C., 20402. $1.00.

Descriptors: (*National defense, Effectiveness), (*Management engineering, Handbooks), (*Costs, Reduction), Budgets, Maintenance, Documentation, Value engineering, Optimization, Materials, Procurement, Data processing systems, Communication systems, Transportation, Housing, Packaging.
Identifiers: Cost reduction.

Cost cutting insights that reap small rewards at one locale or in a relatively minor function could conceivably save substantial sums when extended to other locales and functions. This pamphlet, which organizes a thousand cost-saving ideas with relevant bibliographies for wide distribution throughout the Department of Defense, serves as a starting point in the procedure by showing how existing management data can be cataloged and disseminated. (Author)
AD-697 990 MF$0.65

PROSIM V INSTRUCTOR MANUAL.
Technical rept.,
Auburn Univ Ala
Joe H. Mize, Bruce E. Herring, Myung S. Chun, and Clifford L. Cook. Nov 69, 316p Rept no. THEMIS-AU-T-5
Contract DAAH01-68-C-0296

Descriptors: (*Production control, Programming (Computers)), Instruction manuals, Simulators, Mathematical models, Computer logic, Computer programs, Data storage systems, Teaching methods.
Identifiers: Computerized simulation, Themis project, PROSIM 5 production system simulator.

A production system simulator has been developed which is capable of simulating a wide variety of realistic manufacturing environments. The simulator is used as an aid in teaching the concepts of designing production control systems and as a research vehicle for investigating various aspects of control theory for production systems. The report contains the instructor manual which explains to the instructor how the simulator works, how it can be used to bring a dynamic experience into a production control system design course, how to generate problems, and how to administer its use. Included are four complete problems, a method for checking the local installation of the simulator and a complete listing of all source programs. (Author)
AD-698 041 HC$3.00 MF$0.65

MANPOWER ALLOCATION MODEL. VOLUME I.
Litton Systems Inc Monterey Calif Mellonics Systems Development Div
For primary bibliographic entry see Field 5I.
AD-698 126 HC$3.00 MF$0.65

PRODUCTIVITY MEASUREMENT MODEL.
Litton Systems Inc Monterey Calif Mellonics Systems Development Div
For primary bibliographic entry see Field 5I.
AD-698 127 HC$3.00 MF$0.65

MANPOWER ALLOCATION MODEL. USERS MANUAL.
Litton Systems Inc Monterey Calif Mellonics Systems Development Div
For primary bibliographic entry see Field 5I.
AD-698 128 HC$3.00 MF$0.65

PRODUCTIVITY MEASUREMENT MODEL. USERS MANUAL.
Litton Systems Inc Monterey Calif Mellonics Systems Development Div
For primary bibliographic entry see Field 5I.
AD-698 129 HC$3.00 MF$0.65

DEVELOPING A PROGRAM BUDGETING SYSTEM AS AN AID IN PLANNING HIGHER EDUCATION,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5I.
AD-698 143 HC$3.00 MF$0.65

CAN PUBLIC CONSTRUCTION AND REHABILITATION INCREASE THE QUANTITY OF HOUSING SERVICE CONSUMED BY LOW-INCOME FAMILIES.
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5K.
AD-698 144 HC$3.00 MF$0.65

THE FUTURE ROLE OF THE SOVIET CENTRAL PLANNER,
Research Analysis Corp Mclean Va
For primary bibliographic entry see Field 5C.
AD-698 203 HC$3.00 MF$0.65

DEVELOPMENT OF A MULTIDISPLAY, TIME-SHARED COMPUTER FACILITY AND COMPUTER-AUGMENTED MANAGEMENT-SYSTEM RESEARCH.
Stanford Research Inst., Menlo Park, Calif.
For primary bibliographic entry see Field 9B.
AD-843 577 HC$3.00 MF$0.65

THE SPACE AND TECHNOLOGY TRANSFER PROGRAM QUARTERLY REPORT, 1 JUN. - 31 AUG. 1969.
Pittsburgh Univ., Pa. Knowledge Availability Systems Center.

31 Aug 69, 62p NASA-CR-106307, QR-2
Contract NSR-39-011-106

Descriptors: *Marketing, *Nasa programs, *Space programs, *Technology utilization, Computer programs, Industries, Operational problems, Product development.

For abstract, see STAR 07 24.
N69-40126 HC$3.00 MF$0.65

TECHNOLOGY ASSESSMENT.
George Washington Univ., Washington, D. C.
R. G. Kasper. Jul 69, 171p NASA-CR-106302
Conf- Presented At the Seminar Ser., Program of Policy Studies in Sci. and Technol., Washington, D. C., Jan. - Apr. 1969 Spon- Sponsored By Nasa

Descriptors: *Assessments, *Policies, *Social factors, *Technologies, Conferences, Congress, Governments, Management, Safety.

For abstract, see STAR 07 24.
N69-40301 HC$3.00 MF$0.65

FOREIGN LICENSING - US GOVERNMENT AGENCIES.
National Aeronautics and Space Administration, Washington, D. C.
For primary bibliographic entry see Field 5D.
For abstract, see STAR 07 24.
N69-40384 HC$3.00 MF$0.65

PROGRAM AND PROJECT MANAGEMENT - A DEMAND BIBLIOGRAPHY.
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
9 May 69, 57p NASA-TM-X-61920, GP-698

Descriptors: *Bibliographies, *Management planning, *Project management, *Systems engineering, Aerospace systems, Decision making, Production engineering, Reliability engineering, Statistical analysis.

For abstract, see STAR 07 24.
N69-41006 HC$3.00 MF$0.65

AN APPRAISAL OF THE HARBRIDGE HOUSE STUDY FROM THE RESEARCH AND DEVELOPMENT AGENCY VIEWPOINT.
National Aeronautics and Space Administration, Washington, D. C.
L. Rawicz. 1969, 21p NASA-TM-X-61908
Conf- Presented At Briefing Conf. on Pat. Law, 26 Sep. 1969

Descriptors: *Economics, *Governments, *Industries, *Patents, *Policies, *Research and development, Competition, Inventions.

For abstract, see STAR 07 24.
N69-41136 HC$3.00 MF$0.65

PUBLIC IMPROVEMENTS AND CAPITAL BUDGET: SURGOINSVILLE, TENNESSEE.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.
For primary bibliographic entry see Field 13B.
PB-187 970 HC$3.00 MF$0.65

CAPITAL IMPROVEMENTS PROGRAM AND BUDGET, MILLEN, GEORGIA.
Georgia State Planning Bureau, Atlanta.
For primary bibliographic entry see Field 13B.
PB-187 977 HC$3.00 MF$0.65

LAND POTENTIAL STUDY AND LAND DEVELOPMENT PLAN, ALEXANDER COUNTY, NORTH CAROLINA.
North Carolina State Dept. of Conservation and Development. Div. of Community Planning.
Aug 69, 102p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Management planning, *North Carolina), Terrain, Natural resources, Classification, Predictions, Economics, Recreation, Urban planning, Sociometrics.
Identifiers: *Alexander County (North Carolina), *Land potential studies, Land development, *Regional planning and development, Land use.

The land potential portion of the study provides information about the County's physical, topographic, and cultural features which are related to county development. The land development plan portion of the report contains projections for expected future land use requirements of all major land uses through 1990. (Author)
PB-187 982 HC$3.00 MF$0.65

MAJOR THOROUGHFARE PLAN AND FUTURE LAND USE PLAN, ELBERT COUNTY, GEORGIA,
Georgia State Planning Bureau, Atlanta.
Sydney Carter. Aug 69, 50p

Descriptors: (*Management planning, *Georgia), Roads, Terrain, Classification, Standards, Predictions, Traffic, Vehicles, Urban areas, Population.
Identifiers: Land use, *Elbert County (Georgia).

The document covers an analysis and plan of the major thoroughfares and future land use of Elbert County. The major thoroughfare plan classifies the roads according to type and use, establishes standards for road improvements, determines the growth of traffic volumes, projects future growth of traffic volumes by type and location, and presents a plan for proposed changes and improvements throughout the planning period. The future land use plan is premised by the established goals and objectives of the county. (Author)
PB-187 984 HC$3.00 MF$0.65

NEW YORK STATE APPALACHIAN RESOURCE STUDIES. AGRICULTURE. PHASE I: INVENTORY.
New York State Coll. of Agriculture, Ithaca.
For primary bibliographic entry see Field 2D.
PB-187 985 HC$3.00 MF$0.65

LAND USE AND NATURAL RESOURCE INVENTORY OF NEW YORK STATE,
New York State Office of Planning Coordination, Albany.
Roger A. Swanson. Jun 69, 26p*

Descriptors: (*Management planning, *New York), (*Terrain, Inventory), Aerial photography, Photointerpretation, Classification, Urban areas, Rural areas, Natural resources, Data processing systems, Programming (Computers), Mapping, Population.
Identifiers: *State planning, Land use, Computer graphics, Computer mapping techniques.

The land use and natural resource inventory is a program to identify and record how the state's land resources are being utilized. This comprehensive inventory, the first to be undertaken in the state, examines and identifies from aerial photographs the use of all land area in all 62 counties. An operating land use and natural resource data system with an expanding computerized data library will include the entire state. (Author)
PB-187 986 HC$3.00 MF$0.65

ECONOMIC AND LAND POTENTIAL STUDIES AND LAND DEVELOPMENT PLAN, STOKES COUNTY, NORTH CAROLINA.
North Carolina Dept. of Local Affairs, Salisbury. Div. of Community Planning.
For primary bibliographic entry see Field 5C.
PB-187 987 HC$3.00 MF$0.65

COMMUNITY FACILITIES PLAN FOR FLOYD COUNTY, GEORGIA.
Georgia State Planning Bureau, Atlanta.

Nov 69, 76p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Management planning, *Georgia), Population, Statistical data, Sociometrics, Economics, Classification, Buildings, Predictions.
Identifiers: *Floyd County (Georgia), Community facilities.

The community facilities plan describes the general location, character, extent, and adequacy of all appropriated public facilities, and includes maps of their present and proposed location. (Author)
PB-187 988 HC$3.00 MF$0.65

STRATEGY FOR PLANNING SOUTH TEXAS REGION 1969-1974 (STUDY DESIGN).
South Texas Council of Governments.

1969, 229P
Prepared in cooperation with Garza (Paul), and Associates, Laredo, Tex.

Descriptors: (*Management planning, *Texas), Rural areas, Urban planning, Budgets, Terrain, Construction, Law, Culture, Roads, Public health, Water pollution, Housing, Law, Manpower, Recreation.
Identifiers: Land use, South Texas Council of Governments, Counties, Objectives, *Regional planning and development, International relations.

Identification of regional problems and objectives for a 4-county area under jurisdiction of the South Texas Council of Governments, an analysis of previous accomplishments in planning, and a determination of planning needs are reported. The question of international coordination between the cities of Laredo, Texas and Nuevo Laredo, Mexico and other border cities within the 4-county border area, together with technical assistance which may be given to the Laredo Model Cities program are also discussed. (Author)
PB-187 991 HC$3.00 MF$0.65

ILLIOPOLIS, ILLINOIS, COMPREHENSIVE PLAN.
Sangamon County Regional Planning Commission, Springfield, Ill.
For primary bibliographic entry see Field 13B.
PB-188 005 HC$3.00 MF$0.65

HOMER COMPREHENSIVE DEVELOPMENT PLAN.
Alaska State Housing Authority, Anchorage.
For primary bibliographic entry see Field 13B.
PB-188 009 HC$3.00 MF$0.65

PUBLIC IMPROVEMENTS AND CAPITAL BUDGET: CHURCH HILL, TENNESSEE.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.
For primary bibliographic entry see Field 13B.
PB-188 024 HC$3.00 MF$0.65

COG: MECHANISM FOR MESHING LOCAL GOVERNMENTS.
Heart of Texas Council of Governments, Waco.

Oct 69, 94p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Management planning, *Texas), (*Urban areas, Interactions), Organizations, Law, Terrain, Problem solving, Budgets, Sociometrics, Public health.
Identifiers: Heart of Texas Council of Governments, Local government, Urbanizations, International relations.

The document is concerned with a program to encourage and permit local units of government to join and cooperate with one another to improve the health, safety and general welfare of their citizens; to plan for the future development of communities, areas, and regions to the end that transportation systems may be more carefully planned; that communities, areas, and regions grow with adequate street, utility, health, educational, recreational, and other essential facilities; that needs of agriculture, business, and industry be recognized; that residential areas provide healthy surroundings for family life; that historical and cultural value be preserved; and that the growth of the communities, areas, and regions is commensurate with and promotive of the efficient and economical use of public funds. (Author)
PB-188 042 HC$3.00 MF$0.65

LAND USE INVENTORY AND ANALYSIS, SKETCH LAND USE PLANS, VOLUSIA COUNTY, FLORIDA.
East Central Florida Regional Planning Council, Titusville.

4 Dec 69, 40p

Descriptors: (*Management planning, *Florida), Terrain, Inventory, Classification, Population, Predictions, Maps, Statistical data, Reviews.
Identifiers: Volusia County (Florida), Land use, *Regional planning and development.

The report is divided into five chapters: population projections, land use inventory and analysis, land use policies, sketch land use plans, and methods of plan implementation. (Author)
PB-188 043 HC$3.00 MF$0.65

APPLICATION REVIEW PROCEDURES.
Metropolitan Planning Commission-Kansas City Region, Mo.
For primary bibliographic entry see Field 13B.
PB-188 056 HC$3.00 MF$0.65

DEMAND FOR INDUSTRIAL LAND, 1968 - 1990.
Metropolitan Planning Commission-Kansas City Region, Mo.
For primary bibliographic entry see Field 13B.
PB-188 107 HC$3.00 MF$0.65

CENTRAL NEW YORK REGIONAL ECONOMIC STUDY. PHASE II. ANALYSIS AND PROJECTIONS.
New York State Office of Planning Coordination, Albany.
For primary bibliographic entry see Field 5C.
PB-188 129 HC$3.00 MF$0.65

WORK PROGRAMS FOR THREE STUDIES OF HOUSING IN THE COMPREHENSIVE PLAN.
National Association of Housing and Redevelopment Officials, Washington, D.C.
For primary bibliographic entry see Field 13B.
PB-188 134 HC$3.00 MF$0.65

JONESBORO LAND USE PLAN: JONESBORO, TENNESSEE.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.
For primary bibliographic entry see Field 13B.
PB-188 157 HC$3.00 MF$0.65

EXISTING LAND USE AND FUTURE LAND USE PLAN: JASPER, TENNESSEE.
Tennessee State Planning Commission, Chattanooga. Southeast Regional Office.
For primary bibliographic entry see Field 13B.
PB-188 199 HC$3.00 MF$0.65

SUMMARY OF JONESBORO LAND USE PLAN.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.
For primary bibliographic entry see Field 13B.
PB-188 201 HC$3.00 MF$0.65

COMPREHENSIVE PLAN, SWEETWATER, TENNESSEE, 1969-1990.
Tennessee State Planning Commission, Knoxville. East Tennessee Office.
For primary bibliographic entry see Field 13B.
PB-188 202 HC$3.00 MF$0.65

SMALL BUSINESS GUIDANCE AND DEVELOPMENT CENTER.
Annual rept., 16 Jun 68-15 Jul 69.
Howard Univ., Washington, D.C.

Aug 69, 68p
Contract Cc-6182

Descriptors: (*Commerce, Management engineering), Employment, Psychology, Public opinion, Supervisory personnel, Training.
Identifiers: *Small business.

The Small Business Guidance and Development Center was established in September, 1964 on the Campus of Howard University. It was conceived for the purpose of improving and expanding the business opportunities for black and other minority groups. It was a project of the Task Force on Equal Opportunity in Business, which was also established in 1964 by the former Secretary of Commerce. The report is the annual report of the Center. (Author)
PB-188 211 HC$3.00 MF$0.65

5B. Documentation and Information Technology

RAPID STRUCTURE SEARCHES VIA PERMUTED CHEMICAL LINE-NOTATIONS (III): A COMPUTER-PRODUCED INDEX.
Technical memo. Jun 63-Oct 64,
Chemical Research and Development Labs. Edgewood Arsenal, Md.
John E. Schultz, Gerald W. Gibson, Charles E. Granito, Alan Gelberg, and R. J. Williams. Feb 65, 23p CRDL-TM-7-2
Distribution Limitation now Removed.

Descriptors: (*Information retrieval, *Molecular structure), Search theory, Permutations, Computers, Costs, Systems engineering, Indexes.
Identifiers: Wiswesser chemical notation system, *Chemical notation systems.

The paper is concerned with the use of the Wiswesser line-notation as the basis of a storage and retrieval system for organic structures. This line-notation is an unique and unambiguous method of representing chemical structures by a linear series of letters, numbers, ampersands, and hypens. The uniqueness of the notation permits the use of an alpha-numerically arranged index of the permutations of the notation for structure searching. The paper discusses the preparation of a computer-prepared index of permuted Wiswesser line-notations from the standpoint of the cost, time, and logic of the computer program. The entire cost of preparing such an index of 50,000 structures, i.e., writing and proofing the notations, punching and verifying the punchcards, card and paper costs, rental, and program preparation, is somewhat less than $12,000. The uses, limitations, and methods of further increasing the utility of this powerful and economical retrieval tool by the inclusion of biological, source, cost, and other types of data are also presented. (Author)
AD-460 826 HC$3.00

BUILDING SCIENCE ABSTRACTS. NAME AND SUBJECT INDEXES. VOLUME XXXIX, 1966.
Building Research Station Watford (England)
For primary bibliographic entry see Field 13M.
AD-697 891

CAST ALLOYS. VOLUME 2,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11F.
AD-697 994 HC$3.00 MF$0.65

ACTIVITIES OF THE REGISTRY OF COMPARATIVE PATHOLOGY,
Armed Forces Inst of Pathology Washington D C
For primary bibliographic entry see Field 6E.
AD-698 002

CAST ALLOYS. VOLUME I,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11F.
AD-698 103 HC$3.00 MF$0.65

FORSVARS FORSKNINGS REFERAT (Defense Research Abstracts).
Research Inst of National Defence Stockholm (Sweden)

1969, 20P Rept no. FRO-69/70-1
Text in Swedish.

Descriptors: (*Scientific research, Sweden), Reports, Abstracts, Nuclear physics, Nuclear reactors, Weapon systems, Chemical warfare agents, Military psychology, Physics, Bionics, Communication systems, Electronics.

Abstracts are given, in Swedish, of 78 reports issued by Utgivna av Forsvarets Forskningsanstalt during the period May-Sept 1969.
AD-698 133 HC$3.00 MF$0.65

FORSVARS FORSKNINGS REFERAT: REGISTER (Defense Research Abstracts Index).
Research Inst of National Defence Stockholm (Sweden)
1969, 41P Rept no. FRO-68/69
Text in Swedish.

Descriptors: (*Scientific research, Sweden), Reports, Abstracts, Nuclear physics, Nuclear reactors, Weapon systems, Chemical warfare agents, Military psychology, Physics, Bionics, Communication systems, Electronics.
AD-698 134 HC$3.00 MF$0.65

A GENERAL INDEX TO THE LIBRARY OF CONGRESS CLASSIFICATION,
Rand Corp Santa Monica Calif
Lois Newman. Nov 69, 14p* Rept no. P-4178

Descriptors: (*Indexes, Classification), (*Subject indexing, Vocabulary), Libraries, Language.
Identifiers: Library of Congress Classification Schedules, Natural language.

The index represents an attempt to provide a general index to the Library of Congress Classification Schedules using contemporary natural language. If a subject could be listed two ways, both headings have been used, e.g., Eastern Germany and Democratic Republic of Germany, 1949-. Also some terms are listed specifically and also under a general heading; e.g., Gasoline engines is listed by itself and also under Engines. No cross-references have been employed. The index is by no means inclusive - about 1,300 terms are included. The terms represent a wide range of topics in all fields of knowledge and are used by all types of libraries. (Author)
AD-698 181 HC$3.00 MF$0.65

LOGICAL ASPECTS OF QUESTION-ANSWERING BY COMPUTER,
Rand Corp Santa Monica Calif
J. L. Kuhns. Dec 69, 33p Rept no. P-4251

Descriptors: (*Information retrieval, *Mathematical logic), Linguistics, Programming (Computers), Data storage systems.
Identifiers: Predicate calculus, Relational data files.

The paper discusses the problem of computerized question-answering from the point of view of certain technical, although elementary, notions of logic. Although the work reported herein has general application to the design of information systems, it is specifically motivated by the RAND Relational Data File. This system, for which a prototype has been implemented, deals with the retrieval and processing of information from a large file of relational sentences. The report does not discuss specific details of the system but rather an abstract version of it. The purpose is to demonstrate how notions in logic can be used to influence the design of components of an information system. A secondary purpose is to show how logic can be applied to the analysis of natural-language. (Author)
AD-698 185 HC$3.00 MF$0.65

A FRAMEWORK FOR FUTURE DATA CENTERS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
For primary bibliographic entry see Field 22A.
For abstract, see STAR 07 24.
N69-40124 HC$3.00 MF$0.65

PRODUCTS LIABILITY - A DEMAND BIBLIOGRAPHY.
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

2 Sep 69, 17p NASA-TM-X-61919, GP-756

Descriptors: *Bibliographies, *Legal liability, *Production engineering, Industrial safety, Industries, Manufacturing.

For abstract, see STAR 07 24.
N69-41140 HC$3.00 MF$0.65

INFORMATION SCIENCE: TOWARD THE DEVELOPMENT OF A TRUE SCIENTIFIC DISCIPLINE.
Technical rept.,
Ohio State Univ., Columbus. Computer and Information Science Research Center.
M. C. Yovits. Jun 69, 30p* CISRC-TR-69-8
Grant NSF-GN-534.1

Descriptors: (*Information retrieval, Mathematical models), (*Documentation, Education), Dissemination, Scientific research, Decision making.
Identifiers: *Information science, Curricula.

It is pointed out that if information science is to be considered a 'true' science similar to physics or chemistry then it must have a set of concepts and analytical expressions which apply to the flow of information in a general way. Such expressions should be relatively independent of the particular context or application under consideration. Definitions of a rigorous nature for the fundamental quantities involved must be established. These must have general applicability and must be related to other known and measurable quantities. It is desirable also that they be capable of quantification. Several previous papers have described a model of a generalized information system which has wide and perhaps universal applicability. This paper elaborates on this model and indicates the range of its applicability. Several fundamental quantities are defined specifically in a way which allows for quantification. It is pointed out that this model can be the basis for the development of a 'true' science of information with all the necessary requirements for a science. By the use of this model and the definition of a 'true' science, the goals and requirements for a curriculum in information science are thus established. (Author)
PB-187 983 HC$3.00 MF$0.65

REPORT OF NRL PROGRESS.
Naval Research Lab., Washington, D.C.

Nov 69, 32p
Available on subcription at $15.00/year, and $18.00/year foreign.

Descriptors: (*Naval research, Reports), Abstracts, Cosmic rays, Ocean currents, Shallow water, Acoustics, Chemistry, Communication systems, Computers, Lasers, Metallurgy, Solid state physics, Radar, Light pulses.
Identifiers: Marine layers.

Contents: cosmic-ray neutrons in the first six meters beneath a water surface; Optical third-harmonic measurements of subpicosecond light pulses; Acoustics; Chemistry; Communications sciences; Computers; Electronic components; Metallurgy; Radar; Solid state physics.
PB-188 007 HC$3.00 MF$0.65

REPORT AND RECOMMENDATIONS ON THE DEVELOPMENT OF A STATE INFORMATION SYSTEM FOR SOUTH CAROLINA.
EDP Technology, Inc., Falls Church, Va.
For primary bibliographic entry see Field 9B.
PB-188 041 HC$3.00 MF$0.65

DEVELOPMENT OF AN ENGINEERED PLAN FOR A UNITED ENGINEERING INFORMATION SERVICE (UEIS). VOLUME I. THE ENGINEERED PLAN.
Final rept.,
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
D. M. Liston, Jr., M. L. Schoene, W. D. Penniman, R. S. Kohn, and W. J. Harris, Jr. 21 Jul 69, 81p*
Grant NSF-GN-760
See also Volume 2, PB-188 053.

Descriptors: (*Information retrieval, *Engineering), Scientific research, Dissemination, Management engineering.
Identifiers: UEIS (United Engineering Information Service), United engineering information service, *Information services.

The proposed UEIS is fully described including its mission, purpose, scope, recommended operations, organization, and financial structure. The detailed implementation plan is presented including financial requirements, time frame, specific points of decision, personnel requirements, and an estimation of the probability of success. In addition, a description of the existing engineering information and data environment and the major inadequacies in that environment supporting the need for a UEIS are identified and discussed. A discussion of significant alternative concepts for the UEIS is also presented. (Author)
PB-188 052 HC$3.00 MF$0.65

DEVELOPMENT OF AN ENGINEERED PLAN FOR A UNITED ENGINEERING INFORMATION SERVICE (UEIS). VOLUME II. APPENDIX.
Final rept.
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.

21 Jul 69, 283p*
Grant NSF-GN-760
See also Volume 1, PB-188 052.

Descriptors: (*Information retrieval, *Engineering), Scientific research, Dissemination, Management engineering.
Identifiers: UEIS (United Engineering Information Service), United engineering information service, *Information services.

Contents: The Battelle approach; Development of alternative cases; Testing the cases and functions; Development of the implementation plan.
PB-188 053 HC$3.00 MF$0.65

REPORT OF NRL PROGRESS.
Naval Research Lab., Washington, D.C.

Oct 69, 41p
See also Reports dated Sep 69, PB-186 334 and Nov 69, PB-188 007. Also available on subscription at $15.00/year and $18.00/year foreign.

Descriptors: (*Naval research, Reports), Abstracts, Acoustics, Astrophysics, Atmosphere, Chemistry, Electronics, Metallurgy, Oceanology, Plasma physics, Radar.

Contents: Scattering of acoustic pulses by a rigid sphere in a fluid; Acoustics; Atmosphere and astrophysics; Chemistry; Electronics; Metallurgy; Ocean technology; Plasma physics; Radar.
PB-188 225 HC$3.00 MF$0.65

BIBLIOGRAPHIES OF ATOMIC ENERGY LITERATURE. ISSUED OR IN PROGRESS DURING THE PERIOD JULY-AUGUST 1969.
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
1969, 8P

Descriptors: (*Nuclear engineering, *Bibliographies), Nuclear physics.

For abstract, see NSA 23 23.
TID-3754 HC$3.00 MF$0.65

5C. Economics

ESTIMATION OF CES PRODUCTION FUNCTIONS FOR US MANUFACTURING BY INPUT-OUTPUT SECTOR.
Research paper,
Institute for Defense Analyses Arlington Va Program Analysis Div
Bruce T. Grimm. Jul 69, 64p* Rept no. RP-P-525
IDA/HQ-69-10227
Contract OCD-PS-66-113

Descriptors: (*Industrial production, United States), (*Economics, Factor analysis), Statistical processes, Approximation (Mathematics), Labor, Money, Mathematical models, Numerical analysis.
Identifiers: Constant elasticity of substitution, Production functions.

The report presents estimates of the production functions for United States manufacturing aggregated to input-output sectors. These estimates are based on a cross-section sample of actual capital and labor usage in order to evaluate the potential substitution between these factors. This method was employed as an alternative to examining the substitution of factors by using an engineering approach and aggregating up to the level of input-output sectors. The examination was conducted in such a way that the results obtained could be used in the construction of a model of the real output of the United States economy. (Author)
AD-697 926 HC$3.00 MF$0.65

AREA HANDBOOK FOR ARGENTINA,
American Univ Washington D C Foreign Area Studies Div
Frederick P. Munson, Thomas E. Weil, Jan Knippers Black, Howard I. Blutstein, and Kenneth W. Martindale. Oct 69, 440p DA-PAM-550-73
Availability: Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $3.50.

Descriptors: (*Argentina, Handbooks), Economics, Political science, Sociology, Military organizations, Armed forces (Foreign), Public health, Law, Terrain, Weather, Transportation.
Identifiers: *Area studies.

The volume is designed to be useful to military and other personnel who need a convenient compilation of basic facts about the social, economic, political, and military institutions and practices of various countries. The emphasis is on objective description of the nation's present society and the kinds of possible or probable changes that might be expected in the future. (Author)
AD-698 093 MF$0.65

THE EFFECTS OF A SIMPLE RENT CONTROL SCHEME IN A COMPETITIVE HOUSING MARKET,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5K.
AD-698 147 HC$3.00 MF$0.65

AN EFFICIENT METHOD OF IMPROVING THE HOUSING OF LOW INCOME FAMILIES,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5K.
AD-698 148 HC$3.00 MF$0.65

INTERRELATIONSHIPS BETWEEN PROCREATION AND OTHER FAMILY DECISIONMAKING,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5K.
AD-698 182 HC$3.00 MF$0.65

INCENTIVE EFFECTS OF SOME PURE AND MIXED TRANSFER SYSTEMS,
Rand Corp Santa Monica Calif
Michael C. Barth, and David H. Greenberg. Dec 69, 29p Rept no. P-4266

Descriptors: (*Wages, Feasibility studies), (*Federal budgets, *Employment), Operators (Personnel), Mathematical analysis, Motivation, Economics, Sociometrics, Attitudes, Effectiveness.
Identifiers: Wage subsidies, Poverty, Negative income, Income transfers.

Direct income transfers to the poor are considered by many a necessary, if insufficient, weapon in the war on poverty. The most widely discussed instrument for implementing such a transfer is the negative income tax. A promising competitor, which is just beginning to receive the attention it deserves, is the wage subsidy. Since most of the discussion on income maintenance has turned on the labor supply effects of various alternatives, the document considers it as an important feature. (Author)
AD-698 187 HC$3.00 MF$0.65

THE INDUSTRIALIZATION OF SOVIET RUSSIA IN THE FIRST HALF CENTURY,
Research Analysis Corp Mclean Va
John P. Hardt, and Carl Modig. Jul 68, 25p Rept no. RAC-P-36

Descriptors: (*Industries, *USSR), Economics, Political science, Communism, History, Steel, Coal, Electric power production, Metallurgy, Chemicals, Machine tools, Vehicles.

The purpose of the paper is to survey the industrial-development process in Russia for the first half century of Soviet rule. Soviet industrialization was in part a continuation of trends and fulfillment of aims predating the revolution; the material preconditions for economic development and the necessary motivation were both present in 1913. This continuity between tsarist and Soviet objectives explains the reference to Soviet Russia in the title. The aim of this paper is to provide a brief survey of economic performance over the period and to give some understanding of the basic planning mechanism rather than to analyze or, indeed, to appraise the record against normative standards. In this the focus is on those periods in which Joseph Stalin was the dominant figure and influence on the course of Soviet economic development. These were the periods in which a unique Soviet pattern was developed, distinctive from tsarist or Western counterparts. (Author)
AD-698 197 HC$3.00 MF$0.65

ISRAEL AND THE EASTERN ARAB STATES: A STRATEGIC SOURCE BOOK,
Research Analysis Corp Mclean Va
For primary bibliographic entry see Field 15D.
AD-698 200 HC$3.00 MF$0.65

THE FUTURE ROLE OF THE SOVIET CENTRAL PLANNER,
Research Analysis Corp Mclean Va
John P. Hardt. 1964, 33p Rept no. RAC-E-89
Presented at Saint Antony's College, Oxford (England), 25 May 64.

Descriptors: (*Management planning, Reviews), (*Economics, USSR), Costs, Industries, Growth, Military requirements, Agriculture, Government (Foreign), Food, Distribution, Communism.

A review is given of the following problem areas in economic planning in the USSR: The relationship between defense claims on the economy and industrial sectors crucial to maintaining a high growth rate; and The state of agriculture as it may provide not only a stable grain harvest but also the basis of improvement in the Soviet standard of living through improvement in the diet; a requirement which places new demands on the traditional Soviet industrial branches. (Author)
AD-698 203 HC$3.00 MF$0.65

ECONOMIC GEOGRAPHY OF THE USSR: GEOGRAPHY OF HEAVY INDUSTRY,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 8F.
JPRS-49321 HC$3.00 MF$0.65

GUIDELINES ON METHODS PERTAINING TO THE COMPILATION OF THE STATE PLAN FOR DEVELOPMENT OF THE USSR NATIONAL ECONOMY. PART I,
Joint Publications Research Service, Washington, D.C.
N. P. Lebedinskii. 3 Dec 69, 547p
Trans. of mono. Part 1, Metodicheskie Ukazaniya k Sostavleniyu Gosudarstvennogo Plana Razvitiya Narodnogo Khozyaistva SSSR, Moscow, 1969 p1-537. See also Part 2, JPRS-49344-2.

Descriptors: (*Economics, *USSR), Government (Foreign), Management planning, Industries, Agriculture, Transportation, Construction, Labor, Costs, Commerce, Education, Wages, Production, Distribution.

Contents: The planning of industry; Planning of agriculture and forestry; Transport and communications; Planning capital construction; Geological prospecting; Labor and personnel; Profit, profitability, production and distribution costs; Trade; Consumer services and public utilities; Public education, culture, and public health; The standard of living. The balance of personal income and expenditures; The National Economy of the USSR and of the Union Republics, and Planning foreign economic relations.
JPRS-49344-1 HC$3.00 MF$0.65

GUIDELINES ON METHODS PERTAINING TO THE COMPILATION OF THE STATE PLAN FOR DEVELOPMENT OF THE USSR NATIONAL ECONOMY. PART II,
Joint Publications Research Service, Washington, D.C.
N. P. Lebedinskii. 3 Dec 69, 456p
Trans. of mono. Part 2, Metodicheskie Ukazaniya k Sostavleniyu Gosudarstvennogo Plana Razvitiya Narodnogo Khozyaistva SSSR, Moscow, 1969 p538-992. See also Part 1, JPRS-49344-1.

Descriptors: (*Economics, *USSR), Government (Foreign), Management planning, Industries, Agriculture, Transportation, Construction, Labor, Costs, Commerce, Education, Wages, Production, Distribution.

Contents: The planning of trade, Consumer services and public utilities; Public education, culture, and public health; The standard of living - the balance of personal income and expenditures; The national economy of the USSR and of the Union Republics, and Planning foreign economic relations.
JPRS-49344-2 HC$3.00 MF$0.65

EUROPEAN SPACE ORGANIZATIONS - ELDO.
European Space Vehicle Launcher Development Organization, Paris (France).
For primary bibliographic entry see Field 22D.
For abstract, see STAR 07 24.
N69-41291 HC$3.00 MF$0.65

COORDINATION OF SPACE PROGRAMS - THE EUROPEAN SPACE CONFERENCE.
European Space Vehicle Launcher Development Organization, Paris (France).
For primary bibliographic entry see Field 22D.
For abstract, see STAR 07 24.
N69-41378 HC$3.00 MF$0.65

NUCLEAR ENERGY CENTERS: THE PROBLEMS OF IMPLEMENTATION,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18L.
For abstract, see NSA 23 23.
ORNL-4295 HC$3.00 MF$0.65

REPORT ON THE RELATIONSHIP OF FARES, SERVICES AND COSTS FOR D. C. TRANSIT SYSTEM, INC.
Voorhees (Alan M.) and Associates, Inc., McLean, Va.
For primary bibliographic entry see Field 13F.
PB-187 978 HC$3.00 MF$0.65

POPULATION AND ECONOMY STUDY, MARSHALL, NORTH CAROLINA.
North Carolina State Dept. of Local Affairs, Marshall. Div. of Community Planning.
For primary bibliographic entry see Field 5K.
PB-187 981 HC$3.00 MF$0.65

ECONOMIC AND LAND POTENTIAL STUDIES AND LAND DEVELOPMENT PLAN, STOKES COUNTY, NORTH CAROLINA.
North Carolina Dept. of Local Affairs, Salisbury. Div. of Community Planning.
Nov 69, 130p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Management planning, *North Carolina), Terrain, Economics, Population, Statistical data, Sociometrics, Industries, Commerce, Classification, Predictions, Rural areas.
Identifiers: Land potential studies, *Stokes County (North Carolina), Regional planning and development.

Stokes County is predominately rural in character, but is urbanizing rapidly in its southern sections as a result of the opening of an interstate-standard expressway linking it to Winston-Salem. An inventory of the population and economic resources is analyzed along with the county's natural and man-made features and resources, to arrive at a land development plan taking into account the widely different types of potential in the northern and southern sections. (Author)
PB-187 987 HC$3.00 MF$0.65

NENANA-COMPREHENSIVE PLANNING STUDIES.
Alaska State Housing Authority, Anchorage.
For primary bibliographic entry see Field 13B.
PB-187 989 HC$3.00 MF$0.65

THE CONTRIBUTION OF EDUCATION TO ECONOMIC GROWTH IN THE STATE OF MICHIGAN.
Final rept.,
Michigan Univ., Ann Arbor. School of Education.
John S. Chase, and James. L. Miller, Jr. Jun 69, 309p 02251-1-F
Sponsored by Dept. of Labor, Washington, D.C.

Descriptors: (*Economics, *Michigan), (*Education, Impact), Reviews, Statistical analysis, Population, Employment, Mathematical prediction, Growth, Correlation techniques, Mobility, Pattern recognition, Background.
Identifiers: College graduates, Migration patterns, Questionnaires.

An intensive analysis bringing together the three elements of economic growth, the role of education, and the effect of migration would be a logical

undertaking in this type of report. The extensive commitment of time and funds required suggests that a scaled-down study ought first to be undertaken. The objectives of this study are seen as consonant with such an approach. (Author)
PB-188 010 HC$3.00 MF$0.65

SOUTHERN CALIFORNIA ECONOMIC TRENDS: 1940-1970.
Southern California Association of Governments, Los Angeles.

Aug 69, 334p
Prepared in cooperation with Urbanomics Research Associates, Claremont, Calif. Sponsored in part by Department of Housing and Urban Development, Washington, D.C.

Descriptors: (*Economics, *California), Growth, Population, Industries, Commerce, Sociology, Urban planning, Urban areas, Rural areas, Political science, Management planning, Employment, Roads, Wages, Construction, Agriculture, Analysis, Aircraft industry, Petroleum industry.
Identifiers: *Southern California, *Regional planning and development, *Economic development, Trends, Urbanization, Industrialization, Land use, Local government, Defense industry, Motion picture industry.

This study presents an in-depth analysis of significant economic growth trends in Southern California between 1940 and 1970. The general framework of the study centers around (1) the facts or indices which measure the extent of economic growth and development within the regional economy since 1940; (2) the socio-economic and environmental problems generated by the growth process; (3) the public policy issues emerging from these problems; and (4) the public policy implications of regional economic development trends as they relate to the planning process and intergovernmental relationships in Southern California. (Author)
PB-188 012 HC$3.00 MF$0.65

CENTRAL NEW YORK REGIONAL ECONOMIC STUDY. PHASE II. ANALYSIS AND PROJECTIONS.
New York State Office of Planning Coordination, Albany.

Sep 69, 187p

Descriptors: (*Economics, *New York), Transformations, Sociometrics, Management planning, Predictions, Federal budgets, Control systems, Rural areas, Urban areas, Reviews, Problem solving, Environment, Industries, Labor, Attitudes, Training.
Identifiers: Economic trends, Public facilities, Counties.

The overall purpose of the report is to delineate the factors which have affected economic change in the region and to project and analyze how government planning might condition these trends. Initially, the projections will consider the directions of major variables of economic development, such as labor force, employment by industrial and occupation category, and income. Based on these variables, and assuming a continuation of presently observable ecological trends, the report outlines programs to further the region's development as an economic entity. (Author)
PB-188 129 HC$3.00 MF$0.65

CONTRACT BETWEEN ECONOMIC DEVELOPMENT ADMINISTRATION AND GLOUCESTER FISHERIES COMMISSION.
Final rept.,
Gloucester Fisheries Commission, Mass.
Charles E. Martin, and Salvatore J. Favazza. Dec 69, 35p
Contract C-7-35206

Descriptors: (*Fishes, Industries), (*Industries, *Massachusetts), Commerce, Management planning, Training, Seafood, Production, Crustacea.
Identifiers: *Glouchester (Massachusetts), *Lobster fisheries, *Shrimp fisheries, *Fisheries.

The purpose of the Gloucester Fisheries Commission Extension Service was to provide the liaison between the industry and the scientific and research bodies such as the Bureau of Commercial Fisheries. The project started on April 1, 1967 and operated for a period of two years. Two years of planning and promotion plus the dissemination of information on new product development, advanced fishing technologies, federal aid programs, and market development have had their results in the fishing industry. New methods and equipment were introduced in the deep-water lobster fishery; shrimp fishery was developed; and market products in a form meeting excellent consumer acceptance were processed. (Author)
PB-188 197 HC$3.00 MF$0.65

ECONOMIC FEASIBILITY AND SITE LOCATION ANALYSIS OF AN INDUSTRIAL PARK AND WAREHOUSING COMPLEX IN LIVINGSTON, ST. HELENA AND TANGIPAHOA PARISHES.
Gulf South Research Inst., Baton Rough, La.

Oct 69, 191p
Sponsored in part by the Economic Development Administration. Washington, D.C. PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Economics, *Louisiana), Urban planning, Rural areas, Natural resources, Climatology, Wages, Employment, Industries, Site selection, Terrain, Transportation, Predictions, Costs.
Identifiers: *Industrial parks, *Livingston Parish (Louisiana), *Saint Helena Parish (Louisiana), *Tangipahoa Parish (Louisiana).

The study evaluates the feasibility of developing an industrial park as a means of encouraging the location of industry, creating jobs, raising income levels of residents, and providing a vehicle for the expansion and diversification of the area's economy. (Author)
PB-188 200 HC$3.00 MF$0.65

PRODUCTION, PRICES, EMPLOYMENT, AND TRADE IN NORTHWEST FOREST INDUSTRIES.
Quarterly rept. no. 3, 1969,
Pacific Northwest Forest and Range Experiment Station, Portland, Oreg.
John W. Austin. 1969, 59p
See also Quarterly rept. no. 2, PB-186 119.

Descriptors: (*Forestry, Industries), Wood, Wood pulp, Production, Costs, Employment, Commerce, Statistical data, Washington (State), Oregon, Idaho, Montana, California, Alaska, Canada, British Columbia.
Identifiers: *Wood products.

The report presents current information on the timber situation in the Northwest, including data on lumber and plywood production and prices; timber harvest; employment in the forest industries, international trade in logs, lumber, and plywood; volume and average prices of stumpage sold by public agencies; and other related items. (Author)
PB-188 204 HC$3.00 MF$0.65

SMALL BUSINESS GUIDANCE AND DEVELOPMENT CENTER.
Howard Univ., Washington, D.C.
For primary bibliographic entry see Field 5A.
PB-188 211 HC$3.00 MF$0.65

CRYOGENICS AND NATIONAL GOALS, (A-1),
National Bureau of Standards, Boulder, Colo. Inst. for Basic Standards.
T. M. Flynn, and B. W. Birmingham. 1968, 12p R-526
Pub. in Advances in Cryogenic Engineering, v14 p1-12. Proceedings of the Cryogenic Engineering Conference, Cleveland, Ohio, 19-21 Aug 68.

Descriptors: (*Cryogenics, Reviews), Industries, Cryogenic propellants, Hydrogen, Medicine, Food, Superconductivity, Helium, Transportation, Vehicles, Aviation fuels.
Identifiers: Magnetically suspended vehicles.

The paper reviews the importance of cryogenics to some major national programs, such as space, health, agriculture, transportation, conservation, and education. The purpose of the presentation is to demonstrate the interrelation between national objectives and the industry concerned with these fluids; for example, how the space program greatly stimulated the large-scale production of liquid hydrogen, and conversely, how the compressed-gas industry makes the space program possible. (Author)
PB-188 222 HC$3.00 MF$0.65

INTERPRETATION OF GGL CEMENTOGRAMS FOR WELLS IN THE WESTERN PREDKAVKAZE, (Interpretatsiya Tsementogramm GGK po Skvazhinam Zapadnogo Predkavkazya).
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 14B.
For abstract, see NSA 23 23.
UCRL-Trans-10362 HC$3.00 MF$0.65

5D. History, Law, and Political Science

AREA HANDBOOK FOR ARGENTINA,
American Univ Washington D C Foreign Area Studies Div
For primary bibliographic entry see Field 5C.
AD-698 093 MF$0.65

PUBLIC ORDER STUDIES IN NEW YORK CITY,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5K.
AD-698 184 HC$3.00 MF$0.65

EAST ASIAN REGIONALISM AND UNITED STATES SECURITY,
Research Analysis Corp Mclean Va
Bernard K. Gordon. Oct 68, 90p Rept no. RAC-P-45

Descriptors: (*United States Government, *Foreign policy), (*Asia, Foreign policy), Reviews, Economics, China, Japan, Organizations, Government (Foreign).

The study analyzes the nature of American security interests in East Asia in order to relate the concept of Asian regionalism to those interests. (Author)
AD-698 199 HC$3.00 MF$0.65

ISRAEL AND THE EASTERN ARAB STATES: A STRATEGIC SOURCE BOOK,
Research Analysis Corp Mclean Va
For primary bibliographic entry see Field 15D.
AD-698 200 HC$3.00 MF$0.65

INTERNATIONAL POLITICS AND INTERNATIONAL SCIENCE - A STUDY OF SCIENTISTS' ATTITUDES.
Massachusetts Inst. of Tech., Cambridge. Dept. of Political Science.

A. H. Teich. Jun 69, 427p NASA-CR-106330
Contract NGL-22-009-019

Descriptors: *Europe, *International relations, *Politics, *Research facilities, *Scientists, European space programs, Human reactions, International cooperation, Methodology, Physical sciences, Space laboratories.

For abstract, see STAR 07 24.
N69-40029 HC$3.00 MF$0.65

FOREIGN LICENSING - US GOVERNMENT AGENCIES.
National Aeronautics and Space Administration, Washington, D. C.
F. J. Lees. 1969, 55p NASA-TM-X-61909
Conf- Presented At Intern. Pat. Licensing Conf., 9 Oct. 1969

Descriptors: *Foreign trade, *Patents, *United states of america, Conferences, International cooperation, Inventions.

For abstract, see STAR 07 24.
N69-40384 HC$3.00 MF$0.65

SOUTHERN CALIFORNIA ECONOMIC TRENDS: 1940-1970.
Southern California Association of Governments, Los Angeles.
For primary bibliographic entry see Field 5C.
PB-188 012 HC$3.00 MF$0.65

5E. Human Factors Engineering

EXPERIMENTATION AND EVALUATION OF IMPROVED STALL WARNING EQUIPMENT.
National Aviation Facilities Experimental Center Atlantic City N J
For primary bibliographic entry see Field 1D.
AD-697 941 HC$3.00 MF$0.65

EFFECTS OF VIBRATION ON NAVY AND MARINE CORPS HELICOPTER FLIGHT CREWS.
Final rept. 1 Feb-31 Jul 69,
Matrix Research Co Alexandria Va
James M. Ketchel, James W. Danaher, and Charles J. Morrissey. 1 Aug 69, 180p
Contract N00014-69-C-0289

Descriptors: (*Helicopters, Flight crews), (*Vibration, Performance (Human)), Motor reactions, Fatigue (Physiology), Tolerances (Physiology), Aircraft seats, Aircraft equipment, Helmets, Display systems, Antisubmarine aircraft, Rescues, Close support, Noise, Carbon monoxide, Visibility, Vertigo.

Identifiable vibration characteristics of contemporary military helicopters are described. These provide a basis for analyzing and interpreting the literature on vibration research. Emphasis is given to experimental results which relate to frequencies and acceleration amplitudes falling within the helicopter main rotor effects region. The spectrum of military helicopters is tabulated briefly and six representative Navy/Marine Corps helicopters, missions and associated flightcrew tasks are described in more detail. Perceptual-motor behaviors comprising crew tasks in the six missions are identified. These are used to relate vibration analysis results to the helicopter situation. (Author)
AD-698 194 HC$3.00 MF$0.65

ERGONOMICS IN THE DESIGN OF OFFICE FURNITURE: A REVIEW OF EUROPEAN LITERATURE.
Final rept. 1965-1968,
Aerospace Medical Research Lab., Wright-Patterson AFB, Ohio.
K. H. Eberhard Kroemer, and Joan C. Robinette.
Jul 68, 32p AMRL-TR-68-80
Distribution Limitation now Removed.

Descriptors: (*Office equipment+ supplies, Design), State-of-the-art reviews, Human engineering, Posture, Configuration.
Identifiers: Comfort, Dimensions.

The report discusses the European literature on healthy sitting postures and, relatedly, of suitable office and shop furniture, especially of chairs. Recommendations by orthopedists, physiologists, and physical anthropologists are summarized and tabulated for the height, shape, and dimensions of the seat surface; for the shape and dimensions of the back rest; and for the height of office desks, as well as for tables and stands to be used with office machines, such as typewriters. (Author)
AD-848 621 HC$3.00 MF$0.65

5F. Humanities

THE IMPACT OF MODERNIZATION IN THE PHILIPPINES.
Pennsylvania State Univ University Park
For primary bibliographic entry see Field 5K.
AD-697 981 HC$3.00 MF$0.65

5G. Linguistics

PERCEPTION OF LANGUAGE. PART I.
Summary rept.,
Pittsburgh Univ Pa Learning Research and Development Center
Paul M. Kjeldegaard, David L. Horton, and James J. Jenkins. 1969, 193p
Contract Nonr-624 (18)
Proceedings of Symposium of the Learning Research and Development Center, Pittsburgh, Pa., 11-12 Jan 68. Prepared in cooperation with Maryland Univ. College Park, and Minnesota Univ., Minneapolis. See also Part 2, AD-698 132.

Descriptors: (*Language, *Perception (Psychology)), (*Speech, Perception (Psychology)), Reading, Linguistics, Grammars, Auditory perception, Aging (Physiology), Speech compression, Symposia.

Contents: Listening, reading and grammatical structure; Eye-voice span or response bias; Age changes in the selective perception of verbal materials; Division or order; Some acoustic and grammatical features of spontaneous speech; The importance of linguistics for the study of speech hesitations; The perception of time compressed speech; and A perspective on the perception of time compressed speech.
AD-698 131 HC$3.00 MF$0.65

PERCEPTION OF LANGUAGE. PART II.
Summary rept.,
Pittsburgh Univ Pa Learning Research and Development Center
Paul M. Kjeldergaard, David L. Horton, and James J. Jenkins. 1969, 207p
Contract Nonr-624 (18)
Proceedings of Symposium of the Learning Research and Development Center, Pittsburgh, Pa., 11-12 Jan 68. Prepared in cooperation with Maryland Univ. College Park, and Minnesota Univ., Minneapolis. See also Part 1, AD-698 131.

Descriptors: (*Language, *Perception (Psychology)), (*Speech, Perception (Psychology)), Syntax, Speech recognition, Grammars, Motion, Behavior, Auditory perception, Children, Learning, Phonetics, Psychoacoustics, Symposia.
Identifiers: Consonants.

Contents: Current approaches to syntax recognition; What grammar is in the brain; Speech and body motion synchrony of the speaker-hearer; The importance of temporal factors in behavior; An analysis of laterality effects in speech perception; Some psychological aspects of the perception of speech-like data; Children's language development and articulatory breakdown; Perception of phonetic segments--evidence from phonology, acoustics and psychoacoustics; Some comments on the developmental aspects of voicing in stop consonants; and General discussion.
AD-698 132 HC$3.00 MF$0.65

RELATIVE PERCEPTUAL SIMILARITY OF SIXTY INITIAL CONSONANTS.
Ohio State Univ Columbus Dept of Speech
For primary bibliographic entry see Field 17B.
AD-698 205 HC$3.00 MF$0.65

5H. Man-Machine Relations

SYMPOSIUM ON APPLIED MODELS OF MAN-MACHINE SYSTEMS PERFORMANCE, COLUMBUS, OHIO, 12-14 NOVEMBER 1968.
Final rept.,
North American Rockwell Corp Columbus Ohio Columbus Div
Girard W. Levy. 3 Nov 69, 346p Rept no. NR69H-591
Contract N00014-68-C-0418

Descriptors: (*Man-machine systems, *Symposia), Performance (Engineering), Mathematical models, Human engineering, Cybernetics, Performance (Human), Target acquisition, Visual perception, Sonar personnel, Detection, Simulation, Reliability, Identification.
Identifiers: Computerized simulation.

Contents: The role of applied man-machine models; The development of sophisticated models of man-machine system performance; Criteria for selection and application of models; A visual target acquisition model; Unfinished business in the utility of visual detection models; Modeling the sonar operator's detection process--a progress report; Field evaluation of a visual detection model; Human operator models for manual control; Exposition of a human control model and its application; Computer simulation--savior, sanctuary, or silliness; Assumptions underlying the human reliability model; Application of a multiple task interactive model--simulation of human performance in sonar maintenance.
AD-697 939 HC$3.00 MF$0.65

MEASUREMENT AND DISPLAY OF CONTROL INFORMATION, REMOTE MANIPULATION AND MANUAL CONTROL PROGRESS REPORT, 1 OCT. 1968 - 31 MAR. 1969.
Massachusetts Inst. of Tech., Cambridge. Dept. of Mechanical Engineering.
W. R. Ferrell, and T. B. Sheridan. 31 Mar 69, 47p
NASA-CR-106365, DSR-70283-10
Contract NGR-22-009-002

Descriptors: *Display devices, *Manual control, *Operator performance, *Remote handling, Computer programming, Maze learning, Problems, Remote control, Remote sensors.

For abstract, see STAR 07 24.
N69-41053 HC$3.00 MF$0.65

5I. Personnel Selection, Training, and Evaluation

THE NSMC SONAR OPERATOR ALERTNESS RESEARCH APPARATUS: DESCRIPTION AND INSTRUCTIONS FOR USE.
Naval Submarine Medical Center, Groton, Conn.
For primary bibliographic entry see Field 5J.
AD-477 357 HC$3.00 MF$0.65

THE DEVELOPMENT OF A COMPUTER ASSISTED DISTRIBUTION AND ASSIGNMENT (CADA) SYSTEM FOR NAVY ENLISTED PERSONNEL.
Progress rept.,
Naval Personnel Research Activity San Diego Calif

Randall F. Whitehead, Roy N. Suiter, and Robert P. Thorpe. Aug 69, 80p Rept no. NPRA-SRM-70-1

Descriptors: (*Naval personnel, Personnel management), (*Personnel management, Programming (Computers)), Deployment, Man-machine systems, Fleets, Naval operations, Sequences, Classification, Mechanical scanning, Flow charting, Information retrieval.
Identifiers: Enlisted personnel, CADA (Computer Assisted Distribution and Assignment), Computer assisted distribution assignment, Manpower utilization, Alternatives.

The report describes the development of a computerized system to assist Navy personnel managers in carrying out the functions associated with the distribution and assignment of enlisted personnel. This Computer Assisted Distribution and Assignment (CADA) System is aimed at efficient interaction between the computer and a human manager to help maximize the effectiveness of the distribution and assignment decision making process. In general, the CADA System will broaden the range of assignment alternatives for each man and billet, expand the number of decision criteria considered, and be more responsive to changes in the personnel and operational situation. (Author)
AD-697 933 HC$3.00 MF$0.65

FLEET FOLLOWUP ON GROUP IV GRADUATES OF A SCHOOLS.
Research rept.,
Naval Personnel and Training Research Lab San Diego Calif
Adolph V. Anderson, John C. Saylor, Chester R. Bilinski, and Lloyd S. Standlee. Oct 69, 38p Rept no. SRR-70-12

Descriptors: (*Operators (Personnel), *Naval training), (*Performance (Human), Reviews), Reports, Records, Questionnaires, Effectiveness, Adjustment (Psychology), Statistical tests, Learning, Reading, Supervision, Aptitude tests.
Identifiers: Group 4 personnel, Marginal personnel, Military occupations, Navy school graduates.

A nineteen-item questionnaire designed to elicit information relative to work performance, potential, and adjustment was developed and mailed to the duty stations of Group 4 men who had previously been assigned to regular Class A schools to determine whether or not they could successfully complete training in essentially unmodified courses. Questionnaires were also mailed for a matched sample of non-Group 4 men who attended the Class A schools with the Group 4 men. Questionnaire results were tested by chi-square for the significance of differences between the Group 4 and control responses, and an index of overlap between the two distributions was calculated. (Author)
AD-697 934 HC$3.00 MF$0.65

MEMORY FACTORS IN COMPUTER-CONTROLLED MAINTENANCE TRAINING.
Final rept. Nov 67-Nov 68,
Florida State Univ Tallahassee Computer-Assisted Instruction Center
Duncan N. Hansen, and Walter Dick. Aug 69, 44p NAVTRADEVCEN-68-C-0071-1
Contract N61339-68-C-0071

Descriptors: (*Electronics, Teaching machines), (*Maintenance personnel, Naval training), (*Programmed instruction, *Memory), Graphics, Circuits, Cathode ray tubes, Display systems, Algebras, Set theory, Feasibility studies, Computer logic.
Identifiers: Computer graphics, Computer administered instruction, Memory aids.

The purpose of the investigation was to explore those characteristics of training variables that might be incorporated into the design of computerized training devices and systems for or in computer controlled training (CCT). The areas studied were memory aids, computer controlled graphics, electronics circuit analysis, and CCT training schedules. (Author)
AD-697 980 HC$3.00 MF$0.65

DESIGN STUDY OF A TACTILE CUING SYSTEM FOR PILOT TRAINING.
Stanford Research Inst Menlo Park Calif
For primary bibliographic entry see Field 14B.
AD-697 991 HC$3.00 MF$0.65

MICROSCOPIC MOVIE OF FATIGUE INDUCED CRACK INITIATION AND PROPAGATION,
Iowa Univ Iowa City Dept of Mechanical Engineering
For primary bibliographic entry see Field 11F.
AD-698 017 HC$3.00 MF$0.65

IMPROVED MODELS TO MEASURE ARMY PERSONNEL READINESS.
Technical paper,
Research Analysis Corp Mclean Va
Betty W. Holz, and Paul D. Phillips. Nov 69, 55p* Rept no. RAC-TP-381
Contract DAHC19-69-C-0017

Descriptors: (*Combat readiness, Measurement), (*Army personnel, Personnel management), Mathematical models, Programming (Computers), Distribution functions, Quality control, Test methods, Training.
Identifiers: MOS (Military occupational specialties), Military occupational specialties, MOS indicators, Personnel turnover.

Two models for improving insights into the combat readiness of Army units are proposed. One model permits the effects of personnel turnover (turbulence) to be included in a strength indicator. The other model permits a more sophisticated look to be taken at the match between authorized and in-hand skills and skill levels and to modify the MOS indicator accordingly. Neither model requires units to report information not now being reported. Both models are simple in concept and operation, though one requires a simple computer program that is available. (Author)
AD-698 019 HC$3.00 MF$0.65

MANPOWER ALLOCATION MODEL. VOLUME I.
Final rept.
Litton Systems Inc Monterey Calif Mellonics Systems Development Div

16 May 69, 144p NAVPERS-PRD-PRR-69-4-Vol-I
Contract N00022-69-C-0076
See also AD-698 128.

Descriptors: (*Pilots, Naval training), (*Naval personnel, *Manpower), Mathematical models, Costs, Naval air stations, Linear programming.
Identifiers: Allocation models.

A model was developed within the framework of Project (Activity) Analysis to represent a typical Naval Air Training Facility (and perhaps other establishments). The objective was predicting least-cost manning levels in various labor skill categories required to produce trained pilots in predetermined numbers. The model includes restrictions on the number of personnel available in various labor skill categories as well as additional policy constraints and assumes linear relationships among the labor inputs, intermediate products, and the trained pilot outputs expressed in terms of components of technology vectors. This model was specifically applied to NAS Saufley, Whiting, and Ellyson with the CNATRA pilot training rate varying from 2000 to 4000 pilots annually, in increments of 250. (Author)
AD-698 126 HC$3.00 MF$0.65

PRODUCTIVITY MEASUREMENT MODEL.
Final rept.
Litton Systems Inc Monterey Calif Mellonics Systems Development Div

16 May 69, 160p NAVPERS-PRD-PRR-69-5
Contract N00022-69-C-0076
See also AD-698 129.

Descriptors: (*Naval personnel, Production control), (*Production control, *Manpower), Mathematical models, Naval air stations, Costs, Performance (Human).
Identifiers: Productivity.

In connection with a manpower allocation model constructed for the purpose of predicting cost optimal manning levels under various constraints for military and/or industrial installations, a productivity measurement model was developed and applied to three Naval Air Training Stations. Productivity measures are developed here to assist managers to measure outputs per unit of manpower, to identify changes in the occupational or grade structure of the labor force, to bring to the surface the real cost of manpower used, to discover non-labor costs and to permit comparisons between different departments of one establishment as well as between similar departments of two establishments. (Author)
AD-698 127 HC$3.00 MF$0.65

MANPOWER ALLOCATION MODEL. USERS MANUAL.
Litton Systems Inc Monterey Calif Mellonics Systems Development Div

15 Jul 69, 102p NAVPERS-PRD-PRR-70-1
Contract N00022-69-C-0076
See also AD-698 126.

Descriptors: (*Pilots, Naval training), (*Naval personnel, *Manpower), Programming (Computers), Mathematical models, Instruction manuals, Naval air stations, Costs.
Identifiers: Allocation models.

The manual is divided into two major sections. One section describes the operational instructions, and the other section describes the computer program for the model. The manual is designed to provide Navy management with instructions on the use of the model and to provide the programming support staff with detailed instructions and guidelines on the use and modification of the model's computer programs. (Author)
AD-698 128 HC$3.00 MF$0.65

PRODUCTIVITY MEASUREMENT MODEL. USERS MANUAL.
Litton Systems Inc Monterey Calif Mellonics Systems Development Div

15 Jul 69, 36p NAVPERS-PRD-PRR-70-2
Contract N00022-69-C-0076
See also AD-698 127.

Descriptors: (*Naval personnel, Production control), (*Production control, *Manpower), Programming (Computers), Mathematical models, Instruction manuals, Naval air stations, Costs, Performance (Human).
Identifiers: Productivity.

The manual describes the operational instructions and the computer program for the model. The manual is designed to provide managers with instructions on the use of the model and its output, the productivity index, and to provide the managers' programming support element with detailed instructions on the use and modification of the model's computer program. (Author)
AD-698 129 HC$3.00 MF$0.65

DEVELOPING A PROGRAM BUDGETING SYSTEM AS AN AID IN PLANNING HIGHER EDUCATION,
Rand Corp Santa Monica Calif

S. A. Haggart. Nov 69, 14p Rept no. P-4252

Descriptors: (*Education, Management engineering), Systems engineering, Budgets, Scheduling, Costs, Models (Simulations), Control systems, Organizations.
Identifiers: *Program budgeting, Higher education.

Program budgeting has been discussed by proponents and opponents to such a great degree that many of its basic characteristics, or features, have been obscured. This is partly due to the fact that program budgeting means quite different things to different people. A list of features discussed provides a means of picturing these different ideas; the features of program budgeting are rather loosely ranked from the more simple to the more complex. (Author)
AD-698 143 HC$3.00 MF$0.65

INEQUALITY IN INDUSTRIAL AUTHORITY.
Technical rept.,
Princeton Univ N J Center of International Studies
Muriel McClelland. Nov 69, 114p Rept no. TR-4
Contract Nonr-1858 (54), ARPA Order-737

Descriptors: (*Employee relations, *Reviews), (*Personnel management, Inequalities), Supervision, Attitudes, Problem solving, Pattern recognition, Performance (Human), Factor analysis, Industrial relations, Industrial plants, State-of-the-art reviews, United States, France, Japan.
Identifiers: Industrial authority.

The report has two objectives: To test in the secondary literature on work units several dimensions of the analytic scheme devised for studying authority patterns in various social units; and to assess previous studies of authority and authority patterns in factory settings. The data and observations on superordinate-subordinate relations of five empirical studies, three American, one French, and one Japanese, are analyzed with a view to determining perceptions and practices of 'inequality' between superordinates and subordinates. (Author)
AD-698 191 HC$3.00 MF$0.65

EFFECTS OF VIBRATION ON NAVY AND MARINE CORPS HELICOPTER FLIGHT CREWS.
Matrix Research Co Alexandria Va
For primary bibliographic entry see Field 5E.
AD-698 194 HC$3.00 MF$0.65

CONTINUING EDUCATION FOR R AND D CAREERS.
Exploratory study,
Social Research, Inc., Chicago, Ill.
Richard Renck. Jun 69, 224p NSF-69-20
Contract NSF-C457
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. Order No.: NS.1.2:ED 8/6. Price: $1.75.

Descriptors: (*Scientific personnel, *Education), (*Professional personnel, Education), Engineering personnel, Laboratories, Universities, Scientific research, Industrial research, Management engineering.
Identifiers: Research and development careers.

The purpose of the study is to collect and interpret facts relating to the need for, and use of, continuing education by research and development scientists and engineers in large industrial and government R and D laboratories. (Author)
PB-188 000 MF$0.65

THE CONTRIBUTION OF EDUCATION TO ECONOMIC GROWTH IN THE STATE OF MICHIGAN.
Michigan Univ., Ann Arbor. School of Education.
For primary bibliographic entry see Field 5C.
PB-188 010 HC$3.00 MF$0.65

MANPOWER STANDARDS FOR MAINTENANCE OF ELECTRONIC EQUIPMENT (1969).
Technical memo.,
Weather Bureau, Silver Spring, Md. Engineering Div.
Russell L. Hovey. Aug 69, 27p* WBTM-ENG-1

Descriptors: (*Electronic equipment, Maintenance), (*Electronic technicians, Standards), Maintenance personnel, Personnel management, Manpower, Classification, Statistical processes, Analysis.
Identifiers: Weather Bureau.

The equipment maintenance reporting system (EMRS) is used to monitor, analyze, and refine the manpower standards for Weather Bureau electronics technicians. The use of EMRS produces manning standards which constantly are responsive to the needs of the equipment and the Bureau.
PB-188 038 HC$3.00 MF$0.65

ON COMPARATIVE RATINGS OF FORECASTERS.
Weather Bureau, Fort Worth, Tex. Southern Region Headquarters.
For primary bibliographic entry see Field 4B.
PB-188 039 HC$3.00 MF$0.65

A GROUP ORIENTATION APPROACH FOR FACILITATING THE WORK ADJUSTMENT OF THE HARD-CORE UNEMPLOYED.
Final rept.,
Wayne State Univ., Detroit, Mich.
Hjalmar Rosen, and John E. Teahan. 1969, 209p
Contract DL-81-24-88-24

Descriptors: (*Employment, Adjustment (Psychology)), (*Performance (Human), Effectiveness), Reviews, Factor analysis, Personality, Aptitude tests, Motivation, Behavior, Attitudes, Management planning, Group dynamics, Males, Standards.
Identifiers: Dual acculturation, *Hard core unemployed groups, Absenteeism, Negroes, Tardiness, Interviews.

The major objective of the project was to achieve a lasting integration of hard-core unemployed Negro men in an ongoing corporate work force. It was intended to develop values in these men necessary for successful employment, particularly with regard to regularity of attendance, punctuality, conformity to work rules and regulations, and motivation to accept and perform job demands. The general assumption upon which the study is based is that effective employment of the hard-core unemployed is dependent upon 'dual acculturation'. (Author)
PB-188 045 HC$3.00 MF$0.65

AN ANALYSIS OF RURAL MANPOWER MIGRATION PATTERNS IN THE SOUTH PLAINS REGION OF TEXAS.
Doctoral thesis,
Texas Technological Coll., Lubbock. Dept. of Management.
Richard C. Stapleton. Aug 69, 196p

Descriptors: (*Manpower studies, Mobility), (*Texas, *Rural areas), Statistical analysis, Population, Economics, Problem solving, Sociometrics, Environment, Adolescents, Urban areas, United States, Texas, Theses.
Identifiers: Migration patterns, Farm population.

The document presents a historical overview of the process involved in shifting human resources from the agricultural sector to the industrial sector in the United States economy. Male rural youths throughout the nation are often ill-equipped to meet the demands of an urban society after graduating from high school. The study is concerned with determining the degree of success and mobility which a group of male rural youths from the South Plains Region of Texas has displayed in migrating from rural to urban areas. (Author)
PB-188 048 HC$3.00 MF$0.65

PILOT FEASIBILITY STUDY OF TRAINING IN BUSINESS AND INDUSTRY.
Wisconsin Univ., Madison. Industrial Relations Research Inst.
Gerald G. Somers. 30 Sep 69, 39p

Descriptors: (*Industrial training, Feasibility studies), Questionnaires, Industries, Training devices, Statistical analysis, Costs.

The report presents the results of a national mail survey of training in business and industry, including a discussion of feasibility by specific industry group. (Author)
PB-188 049 HC$3.00 MF$0.65

A STUDY OF THE OLDER WOMAN WORKER WHO HAS ATTEMPTED TO ENTER OR REENTER THE WHITE COLLAR LABOR FORCE THROUGH THE ASSISTANCE OF COMMUNITY TRAINING PROGRAMS IN CLERICAL OCCUPATIONS.
Doctoral thesis,
California Univ., Los Angeles.
Dwayne Gene Schramm. 1969, 165p

Descriptors: (*Females, *Employment), (*Training, Employment), Aging (Physiology), Labor, Effectiveness, Children, Statistical data, Theses.
Identifiers: *Clerical training.

The primary purpose of the study was to investigate 6 clerical training programs in which women 35 years of age and over participated in Fresno, California, to determine if the programs assisted these women in making an entry or re-entry into the white collar labor force. A second purpose of the study was to develop a profile of the older woman who participated in the training programs so that the results would provide direct, descriptive information for those who were engaged in the education, job placement, and employment of the older woman. The findings indicated the older woman in the clerical training programs in Fresno, California, was 44 years of age; married; the mother of 2 or 3 children whose median age was 17; and a high school graduate. The older woman had not held a clerical job during her lifetime but had worked steadily at some kind of employment for at least one year. Out of the 58 women interviewed, only 27.6 percent obtained clerical jobs during or after their training; however, the training did make contributions toward eventual employability for many of the women. (Author)
PB-188 050 HC$3.00 MF$0.65

EMPLOYER POLICIES IN A CHANGING LABOR MARKET.
California Univ., Los Angeles. Inst. of Industrial Relations.
Margaret S. Gordon, and Margaret Thal-Larsen.
Jul 69, 657p
Report of the San Francisco Bay Area Employer Policy Survey, 1967.

Descriptors: (*Personnel management, *California), (*Employee relations, Industrial relations), Industries, Labor, Recruiting, Selection, Wages, Training, Employment.
Identifiers: Technological change.

Contents: Employment; The location of industry; Technological change; Industrial relations structure and personnel departments; Recruitment; Selection practices; Promotion; Labor turnover; Wage policy and wage differentials; Training; Employment projections.
PB-188 051 HC$10.00 MF$0.65

TEENAGE UNEMPLOYMENT IN TWO SELECTED RURAL COUNTIES IN THE SOUTH.
Center research and development rept.,
North Carolina State Univ., Raleigh. Center for Occupational Education.

Charles H. Rogers, Rudolph D. Artis, Leonard J. Hausman, Christopher Green, and Walter R. Parker. 1969, 228p 4
Contract DL-81-35-67-27, Grant OEG-2-7-070348-2698

Descriptors: (*Employment, *North Carolina), Rural areas, Training, Education, Personality, Population, Statistical analysis, Questionnaires, Labor, Wages.
Identifiers: *Unemployment, Adolescents, Negros.

The report studied teenage unemployment in a two-county rural area in North Carolina. The objectives were the following: to trace the labor market experience of teenagers, comparing Negro and white youth; to evaluate the relationship of certain personality variables to the employment status of teenagers; to investigate the relationship of certain social and familial characteristics to the employment status of teenagers; to evaluate community factors surrounding the employment of white and Negro teenagers; and to inventory educational and training opportunities for Negro and white youth. (Author)
PB-188 105 HC$3.00 MF$0.65

PAST AND PRESENT COUNSELING AND PLACEMENT PROCEDURES IN PRIVATE EMPLOYMENT AGENCIES--AN EMPIRICAL STUDY,
Santa Clara Univ., Calif. Community Studies Center.
Thomas M. Martinez, John Hedderson, and Paul Verden. 25 Aug 69, 207p
Contract DL-91-05-68-72
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Organizations, *Employment), (*Recruiting, Operation), Reviews, Operators (Personnel), Management engineering, Costs, Attitudes, Effectiveness, Control, Behavior, Labor, Statistical data, Questionnaires, Mobility.
Identifiers: Employment agencies, Counseling, Interviews.

In the chapters dealing with private employment agencies specific and different theoretical framework are considered. No one general theory could conceptualize all the critical factors in the private employment agency phenomenon. Since each of the problems examined is, in its own way, unique, the document adopts the theory which best conceptualizes the problem. The general problems of changing social conditions, worker self-esteem, and manipulation of workers, as each is affected and reflected by job middlemen, are the threads connecting all the chapters. (Author)
PB-188 154 HC$3.00 MF$0.65

A MEMOIR OF RUSSELL B. SCOTT,
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
For primary bibliographic entry see Field 20L.
PB-188 223 HC$3.00 MF$0.65

SELECTED BIBLIOGRAPHY AND ABSTRACTS OF EDUCATIONAL MATERIALS IN PAKISTAN. VOLUME 3, NUMBER 3, 1969: PERIOD COVERED JULY-SEPTEMBER 1969.
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

1969, 67P SFCSI-HEW (TT-69-51053/3)

Descriptors: (*Education, *Pakistan), Bibliographies, Abstracts, Children, Adults, Management planning, Psychometrics, Libraries, Philosophy, Psychology, Instructors, Textbooks, Sociology, Teaching methods.
Identifiers: Curricula, Student unrest.

Contents: Administration, organization and financing of education; Adult education; Childhood education; Comparative education; Curriculum; Development of education; Education goals; Education planning; Education reforms; Elementary secondary education; Examinations; Extra-curricular activities; Higher education; History of education; Islamic education; Libraries; Literature for children; Philosophy of education; Physical education; Professional education; Psychology; Religious education; Science education; Social psychology; Sociology; Students' problems; Teacher education; Teaching methods and media; Technical education; Textbooks; Women's education; General; New education policy (special section); Writers' index.
TT-69-51053/3 HC$3.00 MF$0.65

ISRAEL EDUCATION ABSTRACTS. VOLUME 4, NUMBER 2.
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

1969, 90P SFCSI-HEW (TT-69-55006/2)
A selected bibliography of current and past Israel educational materials, covering period Apr-Jul 69.

Descriptors: (*Education, *Israel), Abstracts, Bibliographies, Labor, Attitudes, Theory, Teaching methods, Learning, Programmed instruction, Management planning, Religion, Problem solving, Abstracts.
Identifiers: Annotated bibliographies, Translations.

The document contains a selected bibliography of current and past literature and materials on the philosophy, policy and practice of education in Israel.
TT-69-55006/2 HC$3.00 MF$0.65

5J. Psychology (Individual and Group Behavior)

THE NSMC SONAR OPERATOR ALERTNESS RESEARCH APPARATUS: DESCRIPTION AND INSTRUCTIONS FOR USE.
Special rept.,
Naval Submarine Medical Center, Groton, Conn.
J. Donald Harris. 28 Sep 65, 12p NSMC-SR-65-6
NAVMED-MF022.03.03-9020.03
Distribution Limitation now Removed.

Descriptors: (*Sonar personnel, Attention), (*Attention, Test equipment), Sonar signals, Simulation, Submarine personnel, Detection, Noise, Sonar equipment, Earphones.

The object of the study was to devise and investigate a portable system with which to perform research on sonar operator vigilance, in the laboratory or while underway in submarines.
AD-477 357 HC$3.00 MF$0.65

FLEET FOLLOWUP ON GROUP IV GRADUATES OF A SCHOOLS.
Naval Personnel and Training Research Lab San Diego Calif
For primary bibliographic entry see Field 5I.
AD-697 934 HC$3.00 MF$0.65

METHODOLOGY IN THE ASSESSMENT OF COMPLEX HUMAN PERFORMANCE: THE EFFECTS OF SIGNAL RATE ON MONITORING A DYNAMIC PROCESS,
Federal Aviation Administration Washington D C Office of Aviation Medicine
W. Dean Chiles, Cheryl Beveridge Bruni, and Robert A. Lewis. Apr 69, 14p Rept no. FAA-AM-69-6

Descriptors: (*Performance (Human), Visual signals), (*Visual signals, Monitors), Dynamics, Probability, Frequency, Reaction (Psychology), Time, Meters, Signal lights, Numerical methods and procedures, Performance tests, Statistical analysis, Students, Reliability.
Identifiers: Mental arithmetic, Signal rate.

Male subjects were tested after extensive training as two five-man 'crews' in an experiment designed to examine the effects of signal rate on the performance of a task involving the monitoring of a dynamic process. Performance was measured using three signal rates with several levels of workload induced by the simultaneous performance of different combinations of tasks involving reaction time, mental arithmetic, pattern discrimination, and group problem solving. (Author)
AD-697 943 HC$3.00 MF$0.65

CONSISTENCY OF PERFORMANCE CHANGE AND AUTONOMIC RESPONSE AS A FUNCTION OF EXPRESSED ATTITUDE TOWARD A SPECIFIC STRESS SITUATION,
Federal Aviation Administration Washington D C Office of Aviation Medicine
David W. Pearson, and Richard I. Thackray. Apr 69, 10p* Rept no. FAA-AM-69-7

Descriptors: (*Stress (Psychology), Performance tests), (*Performance (Human), Predictions), Questionnaires, Students, Anxiety, Attitudes, Threat evaluation, Perception (Psychology), Applied psychology, Aviation personnel, Test methods, Electrocardiography, Electrodes.
Identifiers: Heart rate, Autonomic response, Aviation occupations, Stress behavior, Fear of shock reactions, Electroshock.

Aviation occupations often require the performance of tasks under stressful conditions. Attempts to relate differences among individuals in performance under stress to personality variables have generally not been successful. Based upon responses to a fear of shock item in an attitude questionnaire describing numerous stressful situations, subjects were classified as high fear of shock or low fear of shock types. Results indicate significant differences between groups in both sets of measures and support the hypothesis that attitude questionnaires may be used to predict performance and bodily responses to specific stress situations. (Author)
AD-697 944 HC$3.00 MF$0.65

PATTERNS OF PHYSIOLOGICAL ACTIVITY ACCOMPANYING PERFORMANCE ON A PERCEPTUAL-MOTOR TASK,
Federal Aviation Administration Washington D C Office of Aviation Medicine
Richard I. Thackray. Apr 69, 14p* Rept no. FAA-AM-69-8

Descriptors: (*Performance (Human), Stress (Psychology)), (*Attention, Performance tests), Students, Display systems, Reaction (Psychology), Physiology, Time, Tracking, Test methods, Electrophysiology, Analysis of variance, Air traffic controllers, Radar equipment.
Identifiers: Heart rate, Perceptual motor tasks.

Air traffic controllers are required to spend considerable periods of time observing radar displays. Yet, information regarding physiological measures which best reflect the attentional process in complex vigilance tasks is generally lacking. As an initial approach to gaining such information, a number of physiological measures obtained during performance of a demanding visual-motor (tracking) task were examined in order to determine which measures best differentiated the performance periods from intertrial rest periods. (Author)
AD-697 945 HC$3.00 MF$0.65

OPENING UP CLOSINGS,
Columbia Univ New York
For primary bibliographic entry see Field 5K.
AD-697 965 HC$3.00 MF$0.65

ON THE NATURE OF THE POSTHYPNOTIC SUGGESTION.
Technical rept.,
Institute of the Pennsylvania Hospital Philadelphia
Martin T. Orne. Jan 69, 38p Rept no. TR-51

Contract Nonr-4731 (00)
Prepared in cooperation with Pennsylvania Univ., Philadelphia.

Descriptors: (*Psychiatry, *Reaction (Psychology)), Psychometrics, Analysis.
Identifiers: *Hypnosis, Posthypnotic suggestion.

A series of studies is reported which attempts to clarify the nature of posthypnotic behavior. The extent to which the way in which one defines hypnosis may determine the kind of observations one makes. Many of the difficulties in communication arise from looking in different ways at different things which are called by the same name. Perhaps with more careful attention to details of definition and the precise circumstances of observation one may be able to clarify the kind of controversies that traditionally have been associated with the study of hypnosis. (Author)
AD-697 983 HC$3.00 MF$0.65

CHROMATIC VS ACHROMATIC PICTURES IN THE SCORING OF NEED FOR ACHIEVEMENT AND THE HOSTILE PRESS MEASURE OF FEAR OF FAILURE.
Technical rept.,
State Univ of New York Albany
Richard C. Teevan, Judith L. Ruoff, and William W. Poffenberger. 2 Dec 69, 25p Rept no. TR-33
Contract N00014-70-C-0021

Descriptors: (*Projective techniques, Motivation), Achievement tests, Students, Pictures, Colors, Photographs, Naval research, Statistical analysis, Males, Females, Emotions, Word association.
Identifiers: Thematic apperception tests, Hostile press, Fear of failure, Need for achievement, Achromatic pictures.

A study was designed to examine the effect of color on the scoring of TATs. The stories written in response to a series of six colored pictures were compared to the same pictures presented in black and white. A sample of 107 high school students of both sexes was used. Each story was scored for need for achievement and hostile press. A word count was also made. In agreement with the findings of related studies, the results were studied for evidence that there was a difference in either score depending upon whether or not colored or black and white pictures were used as stimuli. (Author)
AD-698 035 HC$3.00 MF$0.65

THE PSYCHOPHYSICAL DIMENSIONS OF SIMILARITY AMONG RANDOM SHAPES,
Antioch Coll Yellow Springs Ohio Behavior Research Lab
For primary bibliographic entry see Field 6P.
AD-698 070

A FACTOR ANALYSIS OF FIGURAL-MEMORY ABILITIES.
University of Southern California Los Angeles Psychological Lab
For primary bibliographic entry see Field 6P.
AD-698 137 HC$3.00 MF$0.65

INDIVIDUAL AND TWO-MAN TEAM TARGET FINDING PERFORMANCE,
Miami Univ Oxford Ohio
James H. Davis, and John P. Hornseth. 1967, 8p
AMRL-TR-66-127
Contract AF 33 (615)-2032
Availability: Pub. in Human Factors, p39-43 Feb 67.

Descriptors: (*Aerial reconnaissance, Target acquisition), (*Target acquisition, Performance (Human)), Visual perception, Decision making, Target recognition, Accuracy, Tests.

Individuals and two-man teams were tested on three target finding tasks. Effective performance of a target-finding task requires the establishment of an efficient search strategy which minimizes the time taken to find the target. On two of the tasks team performance was no better than would be expected, from normal order statistics, of its more capable member. Team performance on the third task presented evidence of a shift in team search strategy away from independent (or redundant) searching toward a more effective division of labor. (Author)
AD-698 210

PERCEPTUAL QUANTIFICATION OF CONDITIONAL DEPENDENCY,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Dwight E. Erlick, and Robert G. Mills. 5 May 66, 7p Rept no. AMRL-TR-66-70
Availability: Pub. in Jnl. of Experimental Psychology, v73 n1 p9-14 1967.

Descriptors: (*Perception (Psychology), Accuracy), (*Decision making, Accuracy), Statistical analysis, Errors, Correlation techniques.

The investigation was an attempt to gain some insight into methods used by subjects to estimate relatedness. Accuracy of the subjects estimates the correlation between 2 variables whose actual statistical relationship (Pearsonian r) varied from+1.0 to -1.0 was investigated. Sequences of 20 X, Y coordinates of a correlation scatterplot were presented by means of 2 pointers. 14 subjects varying in knowledge of statistics furnished the data. (Author)
AD-698 216

A GROUP ORIENTATION APPROACH FOR FACILITATING THE WORK ADJUSTMENT OF THE HARD-CORE UNEMPLOYED.
Wayne State Univ., Detroit, Mich.
For primary bibliographic entry see Field 5I.
PB-188 045 HC$3.00 MF$0.65

A STUDY OF THE RELATIONSHIP BETWEEN DRIVER DECISION TIME AND DRIVING ACCIDENT AND VIOLATION RECORD.
Final rept.,
Stevens Inst. of Tech., Hoboken, N.J. Davidson Lab.
P. E. Fergenson. Sep 68, 12p* 1329
Sponsored by Public Health Service, Washington, D. C.

Descriptors: (*Motor vehicle operators, Performance tests), (*Reaction (Psychology), Measurement), Motor vehicle accidents, Performance (Human), Correlation techniques, Decision making, Records, Reviews, Data processing systems, Safety.

Subjects matched for driving experience were divided into four groups, according to accident and violation records, and were tested for their ability to process information. Subjects who had a high accident record processed information at a significantly lower rate than non-accident subjects. Subjects who had many violations, but no accidents, were the best information processors. There was a significant interaction between accident and violation record. These results and their implications are discussed. (Author)
PB-188 159 HC$3.00 MF$0.65

5K. Sociology

OPENING UP CLOSINGS,
Columbia Univ New York
Emanuel A. Schegloff, and Harvey Sacks. 1969, 19p
Contracts AF 49 (638)-1761, F44620-28-C-0040
Prepared in cooperation with California Univ., Irvine. Presented at American Sociological Association (Annual Meeting) Sep 69. Sponsored in part by Advanced Research Projects Agency, Washington, D. C.

Descriptors: (*Social communication, Behavior), Interactions, Verbal behavior, Applied psychology, Theory.
Identifiers: Conversation termination.

The paper presents some of the ways that have been developed for dealing with closings in conversation. Earlier work on conversation formulations of several problems that have been employed to cut into aspects of the data. One may derive an initial problem from a consideration of the most basic features of conversation that are now known of. A partial solution is developed. Problematic aspects of that solution lead to the derivation of another problem which permits the further illumination of the data about closings. After relating the two problems, the paper closes with an attempt to specify the domain for which the closing problems, as they have been posed seem apposite. (Author)
AD-697 965 HC$3.00 MF$0.65

THE IMPACT OF MODERNIZATION IN THE PHILIPPINES.
Technical rept. no. 4,
Pennsylvania State Univ University Park
George M. Guthrie, Frank Lynch, William P. Bruton, A. Paul Hare, and Rachel T. Hare. Jun 69, 98p*
Contract Nonr-656 (37), ARPA Order-855
Prepared in cooperation with Ateneo de Manila Univ. (Republic of the Philippines). See also Technical rept. no. 3, AD-689 868.

Descriptors: (*Anthropology, *Philippines), Religion, Culture, Social communication, Students, Children, Behavior, Problem solving, Nutrition, Test methods, Psychometrics.
Identifiers: Cursillo, Tagalog communities (Philippines), Moderization.

The report contains four chapters dealing with projects conducted under a basic research program. The first chapter, a study of the Cursillo, explains how the three-day little course in Christianity is effective on the personal, group, and community levels. The second chapter on cultural differences in communication among Filipino, African, and American Students, presents the results of experiments in networks--problem solving by groups whose members communicated with each other only in writing. The third chapter on autonomy, dependency, and problem solving in Filipino children is a report on the results of psychological tests administered to boys in kindergartern and first grade. The fourth chapter is on infant and maternal nutrition in four Tagalog communities. (Author)
AD-697 981 HC$3.00 MF$0.65

AREA HANDBOOK FOR ARGENTINA,
American Univ Washington D C Foreign Area Studies Div
For primary bibliographic entry see Field 5C.
AD-698 093 MF$0.65

CAN PUBLIC CONSTRUCTION AND REHABILITATION INCREASE THE QUANTITY OF HOUSING SERVICE CONSUMED BY LOW-INCOME FAMILIES.
Rand Corp Santa Monica Calif
Edgar O. Olsen. Dec 69, 13p Rept no. P-4256

Descriptors: (*Housing, *Federal budgets), (*Economics, Theory), Construction, Rehabilitation, Money, Effectiveness, Impact, Equilibrium, Factor analysis, Performance (Human), Management engineering.
Identifiers: Low income families, Subsidies.

It is widely believed that public construction and rehabilitation of dwelling units increase and improve the housing stock. The purpose of this paper is to demonstrate that the most rigorously developed and thoroughly tested theory of the housing market implies that public construction and rehabilitation have no effect on the long run equilibrium quantity of housing service. This theory holds that it is the subsidy which accompa-

nies public construction and rehabilitation that results in greater consumption of housing service. (Author)
AD-698 144 HC$3.00 MF$0.65

EFFECTIVENESS OF FAMILY PLANNING IN TAIWAN: A METHODOLOGY FOR PROGRAM EVALUATION,
Rand Corp Santa Monica Calif
T. Paul Schultz. Nov 69, 74p Rept no. P-4253

Descriptors: (*Birth, Control), (*Population, *Taiwan), Research program administration, Statistical analysis, Cost effectiveness.
Identifiers: *Family planning, *Birth control, Birth rate.

The paper presents some tentative statistical evidence on the association between regional birth rates and family planning program activity in Taiwan as an illustration of a different approach to evaluation of program effectiveness. Most of the analysis dealt with the first two years, 1966 and 1967, in which the national program appeared to have a significant effect on birth rates. (Author)
AD-698 146 HC$3.00 MF$0.65

THE EFFECTS OF A SIMPLE RENT CONTROL SCHEME IN A COMPETITIVE HOUSING MARKET,
Rand Corp Santa Monica Calif
Edgar O. Olsen. Dec 69, 13p Rept no. P-4257

Descriptors: (*Housing, *Economics), (*Federal budgets, Effectiveness), Costs, Control systems, Theory, Value engineering, Equilibrium, Mathematical models.
Identifiers: *Rent control, Competitive markets, Subsidies.

The document discusses government housing programs in relation to the theory of the housing market. Some of the effects of a simple rent control scheme are derived as implications of the assumptions of the most rigorously developed and thoroughly tested theory of the housing market. (Author)
AD-698 147 HC$3.00 MF$0.65

AN EFFICIENT METHOD OF IMPROVING THE HOUSING OF LOW INCOME FAMILIES,
Rand Corp Santa Monica Calif
Edgar O. Olsen. Dec 69, 24p Rept no. P-4258

Descriptors: (*Housing, *Quality control), (*Costs, *Urban planning), Management planning, Law, Mathematical analysis, Efficiency, Decision making, Correlation techniques.
Identifiers: Eligibility requirements, *Law income families, Rent certificates, Housing improvement, Subsidies, Rental property.

The paper has suggested some research pertinent to predicting a few important effects of a rent certificate plan in a city. Much can be done to predict and overcome early shortcomings of the plan by looking at the experience of similar plans in the past. First is the federal food stamp program which is identical in form to the rent certificate plan. Second is the rent allowances of welfare agencies. The operation of these schemes can shed some light on the rent certificate plan. (Author)
AD-698 148 HC$3.00 MF$0.65

INTERRELATIONSHIPS BETWEEN PROCREATION AND OTHER FAMILY DECISIONMAKING,
Rand Corp Santa Monica Calif
Alvin J. Harman. Dec 69, 56p Rept no. P-4267

Descriptors: (*Fertility, Population), (*Economics, Philippines), Labor, Wages, Attitudes, Birth, Control, Reduction, Statistical analysis, Education.
Identifiers: *Family planning, *Birth control.

To gain insights into the relative merits of the various options for policies affecting population growth, the report attempts to develop a model characterizing relevant behavior of individual families, and then to explore the model empirically using data pertaining to the Republic of the Philippines. The five main sectors of family activity which are explored are fertility, labor force participation, income, marriage, and migration. (Author)
AD-698 182 HC$3.00 MF$0.65

PUBLIC ORDER STUDIES IN NEW YORK CITY,
Rand Corp Santa Monica Calif
Sorrel Wildhorn. Nov 69, 14p Rept no. P-4250
Presented at the National Meeting of the Operations Research of America on Law Enforcement and Crime Prevention (36th), Miami Beach, Fla., 10-12 Nov 69.

Descriptors: (*Law, *Urban areas), (*Criminology, Reviews), (*New York, Law), Police, Vehicles, Control systems, Deterrence, Housing, Management planning, Attitudes, Programming (Computers), Communication systems, New York.
Identifiers: *Law and order, Arrest and booking procedures, Minority group recruiting, New York City (New York).

The work is centered on the deployment of patrolmen, detectives, and vehicles; an attempt to relate experimentally the effects of mobile patrol on crime and arrests; improvements in arrest and booking procedures; security in high-rise public housing; a general study of personnel policies and a study of minority recruiting. (Author)
AD-698 184 HC$3.00 MF$0.65

SOCIAL INDICATORS AT THE COUNTY GOVERNMENT LEVEL,
Research Analysis Corp Mclean Va
Howard C. Olson. Jul 68, 24p Rept no. RAC-P-40

Descriptors: (*Sociology, Statistical analysis), Population, Economics, Law, Public health, Education, Recreation, Motor vehicle accidents, Criminology, Water pollution, Air pollution.
Identifiers: *County government.

Late in 1967 the County Executive of Fairfax County, Va., requested the Fairfax-Falls Church Health and Welfare Council to conduct a study to examine the social-welfare needs of the County and the extent to which and how the County should become involved in various social programs. A committee of the Health and Welfare Council carried out such a study. The paper is the committee's report. (Author)
AD-698 198 HC$3.00 MF$0.65

INITIAL HOUSING ELEMENT, BRUNSWICK COUNTY, NORTH CAROLINA.
North Carolina Dept. of Local Affairs, Salisbury. Div. of Community Planning.
For primary bibliographic entry see Field 13B.
PB-187 979 HC$3.00 MF$0.65

POPULATION AND ECONOMY STUDY, MARSHALL, NORTH CAROLINA.
North Carolina State Dept. of Local Affairs, Marshall. Div. of Community Planning.

15 Sep 69, 51p

Descriptors: (*Economics, *North Carolina), Population, Reviews, Problem solving, Sociometrics, Terrain, Roads, Recreation, Urban planning, Analysis, Rural areas.
Identifiers: *Marshall (North Carolina), Appalachia.

An economic and population analysis of Marshall further repeats many problems and trends that are characteristic of rural southern Appalachian communities. The population is hindered by an overall low educational attainment and limited incomes. The economy is still under-capitalized, underemployed, and underdeveloped. The mountainous terrain and agrarian oriented economy have been the major withholding factors to growth. Many economic potentials in the county are, to date, unrealized. Better highway access and more effort toward development of its tourism potential are considered as initial objectives for economic betterment. (Author)
PB-187 981 HC$3.00 MF$0.65

COMMUNITY REPRESENTATION IN COMMUNITY ACTION PROGRAMS.
Rept. no. 5 (Final).
Florence Heller School for Advanced Studies in Social Welfare, Waltham, Mass.

Mar 69, 72p*
Grant OEO-C-6809499A/2

Descriptors: (*Sociometrics, *Urban areas), (*Organizations, Public relations), Personnel, Population, Management planning, Models (Simulations), Pattern recognition, Effectiveness.
Identifiers: Community action agencies, Community action program, Poverty, Policymaking.

The organizational dimension of participation is relevant to planning organizations as well as to service organizations. In this case the organizational output is not direct services but the production of specific plans and proposals. The objective of group participation is to establish plans which call for maximum benefits for a particular population or for the population of a particular district or neighborhood. In either the service organization or the planning organization group participation along the organizational dimension involves persons with a common and primary interest in a particular service or planning organization. (Author)
PB-188 013 HC$3.00 MF$0.65

LOW INCOME HOUSING DEMONSTRATION: AN EVALUATION OF THREE CASE STUDY DWELLINGS,
California Univ., Berkeley. Dept. of Architecture.
Henry Sanoff. Jul 66, 60p
Sponsored in part by Department of Housing and Urban Development, Washington, D.C. See also PB-188 018.

Descriptors: (*Housing projects, Acceptability), (*Housing, Design), Costs, Thermal properties, Structural properties, Optimization, Public opinion, Climatology.
Identifiers: *Low income housing, Evaluation.

The project objective was to develop and construct a housing accommodation at a cost of $8000 per individual dwelling unit in a hot-arid climatic zone characterized by: summer high temperatures of 105F. and a diurnal range of 30F.; winter high temperatures of 60F. and a similar diurnal range. The summers are very dry with clear skys, while the winters are humid and the skys frequently overcast. Three different prototypical dwelling units were designed and constructed in Fresno, California, September 1965, with a central objective to achieve a high degree of comfort without the use of mechanical cooling devices. The demonstration area is essentially inhabited by Negro-American agricultural workers permanently based who have been in the area for several years. They share a low educational and income level, with family incomes averaging $2500 per annum. An image evaluation was developed for measuring public acceptance of the proposed units. The method employed used a 'semantic differential,' which uses polar opposite adjectives to obtain connotative implications of an object. The sample groups were farm workers, bankers and architects. It appeared that the proposed units were well accepted by each of the groups; however, the survey relied on drawings and photographs of models, which are often seductive and misleading. (Author)
PB-188 014 HC$3.00 MF$0.65

LOW INCOME HOUSING DEMONSTRATION,
California Univ., Berkeley. Dept. of Architecture.
Henry Sanoff. Nov 65, 258p
Sponsored in part by Department of Housing and Urban Development, Washington, D.C. See also PB-188 014.

Descriptors: (*Housing projects, Acceptability), (*Housing, Design), Optimization, Climatology, Sociology, Costs, Thermal properties, Structural properties.
Identifiers: *Low income housing, Evaluation.

An extensive analysis was conducted of problems involved in the design of permanent housing for low-income families in a hot-arid region of the United States. Based on this analysis, three prototype dwelling units were designed and constructed in Fresno, California. The project seeks to offer a new approach to the design of low cost housing; an alternative based on environmental comfort and compatability with the sociology of family living patterns. Hence the intent of the project is to demonstrate that low-income families can enjoy adequate physiological comfort despite the deleterious climatological environment. Particular attention was directed to the climatic profile and to experimental and analytic methods which yield the required design data. A survey was also conducted to establish the sociological structure and living patterns of the families for whom these dwellings were intended. Investigations of self help potential and effectiveness were evaluated for inclusion in this program through the assistance of social welfare groups currently operating in this field of study. Further examinations were concerned with the limitations of present housing facilities available for this particular income group with possible corrective action. The study included a complete cross section from the migrant to the permanent base worker. The project was primarily concerned with families in the latter class. (Author)
PB-188 018 HC$3.00 MF$0.65

INITIAL RECONNAISSANCE SURVEY, CLINTON, SOUTH CAROLINA.
South Carolina State Planning and Grants Div., Columbia.
For primary bibliographic entry see Field 13B.
PB-188 027 HC$3.00 MF$0.65

HOUSING-DENVER SMSA: INVENTORY, PROJECTIONS, PROBLEMS AND ISSUES.
Denver Regional Council of Governments, Colo.
For primary bibliographic entry see Field 13B.
PB-188 044 HC$3.00 MF$0.65

AN ANALYSIS OF RURAL MANPOWER MIGRATION PATTERNS IN THE SOUTH PLAINS REGION OF TEXAS.
Texas Technological Coll., Lubbock. Dept. of Management.
For primary bibliographic entry see Field 5I.
PB-188 048 HC$3.00 MF$0.65

ANAKTUVUK PASS, ALASKA VILLAGE CENSUS,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
W. C. Hanson. Nov 69, 31p BNWL-1242
Contract AT (45-1)-1830

Descriptors: (*Population, Alaska), (*Urban areas, *Alaska), Statistical data, Identification, Ecology, Radiation measurement systems.
Identifiers: *Anaktuvuk Pass (Alaska), Census data.

A census was prepared for use in radiation ecology studies involving whole-body counting of the Anaktuvuk Pass people, where age is an important consideration. Several records were consulted, especially those of an individual who maintained the census as part of his several duties in the village; and an updating by a state schoolteacher in the village at that time. The records are not final, but represent such current information as exists. They are presented for the use of interested scientists and laymen who recognize the unique qualities of the Anaktuvuk Pass people and wish to know them better. (Author)
PB-188 136 HC$3.00 MF$0.65

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

IMMUNOCHEMICAL STUDIES OF HUMAN SALIVA.
State Univ of New York Buffalo Dept of Oral Biology
For primary bibliographic entry see Field 6E.
AD-697 977 HC$3.00 MF$0.65

MAMMALIAN alpha-KETO ACID DEHYDROGENASE COMPLEXES. V. RESOLUTION AND RECONSTITUTION STUDIES OF THE PIG HEART PYRUVATE DEHYDROGENASE COMPLEX,
Nagasaki Univ (Japan) Atomic Disease Inst
Taro Hayakawa, Tamotsu Kanzaki, Tsutomu Kitamura, Yukiko Fukuyoshi, and Yukihiko Sakurai. 3 Jan 69, 14p ARDG (FE)-J-232
Contracts DA-CRD-AFE-S$^{(69-34)-(69)-G}$^{113}, PHS-AM-10760_02

Availability: Pub. in Jnl. of Biological Chemistry, v244 n13 p3660-3670, 10 Jul 69.

Descriptors: (*Oxidoreductases, Purification), Separation, Chromatographic analysis, Electron microscopy, Sedimentation, Japan, Coenzymes.
Identifiers: *Dehydrogenases, *Pyruvic dehydrogenase, Nocotinamide adenine dinucleotide, *Lipoamide dehydrogenase, Coenzyme A, *Lipoic acetyltransferase.

The pig heart pyruvate dehydrogenase complex was separated into lipoamide hydrogenase and a colorless fraction by the fractionation on a calcium phosphate gel-cellulose column in the presence of 4 M urea. Subsequently, in the presence of 0.3 M potassium iodide, the colorless fraction was fractionated into two additional components, pyruvate dehydrogenase (7.45 S) and partially resolved lipoate acetyltransferase, with ammonium sulfate. Highly purified lipoate acetyltransferase (28.2 S) was isolated by the resolution of the yellow fraction with 4 M urea, which was separated from the complex in the presence of 0.02 ethanolamine (pH 9.4) on the calcium phosphate gel-cellulose column. All three isolated constituent enzymes were required to reconstitute coenzyme A- and nicotinamide adenine dinucleotide-linked oxidative decarboxylation of pyruvate. Reconstitution of these constituent enzymes to produce a large unit resembling the original complex in composition, hydrodynamic parameters, and enzymic activities was achieved. Morphological resolution and reconstitution of the complex through electron microscopic data have been shown. The macromolecular organization of the complex is discussed. (Author)
AD-698 062

RAPID MICROANALYSIS OF BERYLLIUM IN BIOLOGICAL FLUIDS BY GAS CHROMATOGRAPHY,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 7D.
AD-698 092

DIETARY REGULATION OF GLYCOLYTIC ENZYMES. IV. DIFFERENTIAL HORMONAL EFFECTS IN MALE AND FEMALE RAT JEJUNUM,
Army Medical Research and Nutrition Lab Denver Colo
Fred B. Stifel, Robert H. Herman, and Norton S. Rosenweig. 28 Apr 69, 9p
Presented in part at the Annual Meeting of the Federation of American Societies for Experimental Biology (53rd), Atlantic City, N. J., 13-18 Apr 69. See also AD-694 317.
Availability: Pub. in Biochimica et Biophysica Acta, v184 p495-502 1969.

Descriptors: (*Sex hormones, *Enzymes), (*Progesterone, Enzymes), (*Testosterone, Enzymes), Rats, Intestines, Metabolism, Diet.
Identifiers: *Carbohydrate metabolism, *Diethylstilbestrol, *Estradiol, Jejunum, Kinases.

The effects of oral progesterone, diethylstilbestrol, 17 beta-estradiol and testosterone upon the activity of five enzymes involved in carbohydrate metabolism were studied in the jejunum of both male and female rats. In male rats, jejunal phosphofructokinase activites were in the following order: testosterone> estradiol> diethylstilbestrol> progesterone> control (P< 0.01). In female rats, jejunal phosphofructokinase activities were in the following order: estradiol> diethylstilbestrol> testosterone> progesterone> control (P< 0.01). In female rats, both progesterone and testosterone blocked the adaptive increases in jejunal phosphofructokinase and pyruvate kinase activites caused by estradiol alone. In male rates, in contrast, estradiol blocked the testosterone-produced adaptive increases in the jejunal phosphofructokinase and pyruvate kinase activites. The data implys that the response of the jejunal enzymes to sex hormones is determined in part by the sex of the animal. (Author)
AD-698 208

A-BAND OSMIOPHILIA, ITS MICROSCOPIC DEMONSTRATION WITH SILVER.
Edgewood Arsenal, Md.
For primary bibliographic entry see Field 6C.
AD-825 251 HC$3.00 MF$0.65

CONCENTRATION OF MATTER AND ACTION OF ENZYMES IN COACERVATES.
National Aeronautics and Space Administration, Washington, D. C.
T. N. Yevreinova. Oct 69, 223p NASA-TT-F-525
Tran- Transl. Into English of the Book "kontsentrirovaniye Veshchestv I Deystviye Fermentov V Koatservatkh" Moscow, Nauka Press, 1966 P 3-186

Descriptors: *Biogeny, *Enzyme activity, *Organic compounds, *Physical properties, Carbohydrates, Colloids, Density (number/volume), Drops (liquids), Molecules, Nucleic acids, Proteins.

For abstract, see STAR 07 24.
N69-40324 HC$3.00 MF$0.65

PHOTOLYSIS OF CERTAIN PRECURSORS OF NUCLEIC ACIDS IN THE PRESENCE OF POLYPHOSPHORIC ACID.
Fotoliz Nekotorykh Predshestvennikov Nukleinovykh Kislot V Prisutstuiy Polifosfornoy Kisloty
Techtran Corp., Glen Burnie, Md.
YE. M.Lapinskaya. Oct 69, 8p NASA-TT-F-12571
Contract NASW-1695
Coll- 8 P Refs Tran- Transl. Into English From Zh. Evolyutsionnoi Biokhim. I Fiziol. (Moscow), V. 5, No. 1, 1969 P 10-15

Descriptors: *Chromatography, *Nucleic acids, *Phosphoric acid, *Photolysis, Ph factor, Room temperature, Subzero temperature, Ultraviolet radiation.

For abstract, see STAR 07 24.
N69-40333 HC$3.00 MF$0.65

THE 2,2,2-TRIFLUOR-1-ACYLAMINO ETHYL REST AS A PROTECTIVE GROUP FOR THE

THIOL FUNCTION OF THE CYSTEINE IN PEPTIDE SYNTHESES.
Der 2.2.2.-trifluor-1-acylamino-aethyl-rest Als Schutzgruppe Fuer Die Thiolfunktion des Cysteins Bei Peptidsynthesen
Technische Hochschule Munchen (West Germany).
H. Siebert. 1969, 68p
Lang- in German

Descriptors: *Cysteine, *Fluoroamines, *Peptides, *Sulfur compounds, Amino acids, Chemical reactions, Proteins, Triethyl compounds.

For abstract, see STAR 07 24.
N69-41105 HC$3.00 MF$0.65

EXTRATERRESTRIAL LIFE DETECTION BY ENZYMATICALLY INDUCED EXCHANGE OF O-18 ANNUAL REPORT, 15 MAY 1968 - 15 MAY 1969.
Martin Marietta Corp., Baltimore, Md. Research Inst. for Advanced Studies.
B. Kok. 15 May 69, 10p NASA-CR-106454
Contract NASW-1735

Descriptors: *Enzyme activity, *Extraterrestrial life, *Life detectors, *Oxygen 18, Catalysis, Equilibrium, Ph factor, Temperature.

For abstract, see STAR 07 24.
N69-41322 HC$3.00 MF$0.65

A PHYSICO-CHEMICAL STUDY OF SOME AREAS OF FUNDAMENTAL SIGNIFICANCE TO BIOPHYSICS.
Louisiana State Univ., Baton Rouge.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 23 23.
ORO-3018-53 HC$3.00 MF$0.65

PARTICIPATION OF TRACE ELEMENTS IN BIOCHEMICAL PROCESSES CONNECTED WITH BIOSYNTHESIS OF PROTEINS IN PLANTS,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
For primary bibliographic entry see Field 2A.
PB-187 972T HC$3.00 MF$0.65

BIOCHEMISTRY OF MOLYBDENUM,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
For primary bibliographic entry see Field 2A.
PB-187 973T HC$3.00 MF$0.65

EFFECT OF CORTISONE ON THYMIDINE- AND THYMIDYLATE-KINASE ACTIVITY OF REGENERATING LIVER OF RATS,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
A. D. Olshanetskaya, and M. A. Novikova. 15 Oct 69, 3p NIH-10-20-69
Trans. of Voprosy Meditsinskoi Khimii (USSR) v13 n4 p432-433 1967, by Z. Knowles.

Descriptors: (*Corticosteroid agents, Biosynthesis), Desoxyribonucleic acids, Liver, Rats, USSR.
Identifiers: *Cortisone, Kinases, Thymidine kinase, Enzyme activity.

An investigation was made of the effect of cortisone on the activity of thymidine- and thymidylate kinases isolated from regenerating liver rats. (Author)
PB-187 974T HC$3.00 MF$0.65

BODY FLUIDS ANALYSES PROGRAM.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 6L.
PB-188 130 HC$3.00 MF$0.65

6B. Bioengineering

BIOMEDICAL APPLICATIONS OF NASA SCIENCE AND TECHNOLOGY QUARTERLY PROGRESS REPORT, 15 DEC. 1968 - 14 MAR. 1969.
Research Triangle Inst., Durham, N. C.
J. N. Brown. 14 Mar 69, 103p NASA-CR-106344, RTI-EU-411
Contract NSR-34-004-056

Descriptors: *Biological effects, *Medical science, *Nasa programs, *Technology utilization, Aerospace engineering, Bioinstrumentation, Medical equipment, Medical services.

For abstract, see STAR 07 24.
N69-40089 HC$3.00 MF$0.65

6C. Biology

FREE AMINO ACIDS AND RELATED SUBSTANCES IN MARINE ORGANISMS.
City of Hope Medical Center Duarte Calif
For primary bibliographic entry see Field 8A.
AD-697 976 HC$3.00 MF$0.65

LEPTOSPIROSIS IN BARBARY APES (MACACA SYLVANA),
Armed Forces Inst of Pathology Washington D C
For primary bibliographic entry see Field 2E.
AD-698 005

SYSTEMIC CRYPTOCOCCOSIS IN 2 MONKEYS,
Armed Forces Inst of Pathology Washington D C
For primary bibliographic entry see Field 2E.
AD-698 008

EFFECT OF ADENINE ON VOLUME AND METABOLISM OF ERYTHROCYTES PRESERVED AT 37C.
Final rept. 1 May 68-30 Aug 69,
Brown Univ Providence R I
Fabian J. Lionetti, and John McKay. Dec 69, 20p
Grant DADA17-68-G-9261

Descriptors: (*Adenine, Erythrocytes), (*Erythrocytes, *Preservation), Storage, Metabolism, Blood, Viability.
Identifiers: *Blood preservation.

Adenine (0.54mM) in ACD whole blood was investigated for its ability to prevent or delay contraction or shrinkage of erythrocytes which occurs normally on prolonged incubation at 37C. Adenine was found to extend the glycolytic capacity of erythrocytes, to increase the cell life of adenine nucleotides, and to prevent shrinkage and K+ - Na+ exchange between the cells and plasma. The adenine effects were independent of the time of addition during the incubation until the capacity of the cells to synthesize ATP was lost. This implies that the effect of adenine on volume regulation of erythrocytes was by incorporation into a shape of volume maintaining entity, namely ATP. At 37C adenine in supplemented whole blood is completely converted to hypoxanthine. Kinetically, the time of maximum hypoxanthine synthesis coincided with the total loss of adenine nucleotides, a time at which contraction of cells and cation exchange was markedly accelerated. The incubation or preservation time for maximum hypoxanthine synthesis is the time limit of utility of adenine to erythrocytes. Hypoxanthine may thus be an indicator of the viable period of erythrocyte life in storage. (Author)
AD-698 032 HC$3.00 MF$0.65

ANNUAL PROGRESS REPORT ON RESEARCH PROJECT: I. SPONTANEOUS CHROMOSOMAL ABERRATIONS. II. CHROMOSOMAL DAMAGE INDUCED BY X-IRRADIATION,
Brooke General Hospital Fort Sam Houston Tex
Jose M. Lauro, Eleazar P. Garces, and Isidro Olivo. 1969, 82p

Descriptors: (*Chromosomes, Mutations), (*Radiation effects, Chromosomes), X rays, Lymphocytes, Genetics, Radiation injuries, Cytology, Tables.

The chromosomal investigations include a large number of clinical patients with a diverse variety of disorders, patients with suspected chromosomal disorders, patients with hematological and immunological diseases, normal individuals, and experimental subjects undergoing x-irradiation. Such studies serve to demonstrate that culturing the human lymphocyte is the method par excellence in surveying chromosomal abnormalities in large population groups, and in evaluating chromosomal damage from various environmental factors. The purpose of the study was to observe the spontaneous occurrence of chromosomal abnormalities in a control group of patients and to examine the differences that might occur in individuals exposed to x-rays.
AD-698 045 HC$3.00 MF$0.65

LABORATORY EXPERIENCE WITH IN SITU DETECTION OF BERYLLIUM IN BIOLOGICAL SPECIMENS,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Solomon F. Brokeshoulder, and Farrel R. Robinson. 7 Jun 68, 5p Rept no. AMRL-TR-66-203
Availability: Pub. in Applied Spectroscopy, v22 n6 p758-760 Nov/Dec 68.

Descriptors: (*Beryllium, Detection), (*Tissues (Biology), Beryllium), Detectors, Histology, Lasers, Probes, Spectroscopy.

Suitable microspectrochemical techniques have been devised for the laser microprobe to detect beryllium in histologic structures. Density and type of tissue, thickness of the specimen, character of the embedding medium, concentration and localization of the element, and the penetrability of the laser beam must be considered in preparing biological specimens for chemical analysis by the microspectrochemical technique. Advantages of this technique are the identification of specific elements in situ and the correlation of the presence of the element with a specific histologic structure. (Author)
AD-698 091

A LIST OF REFERENCES TO THE AMPHIBIA AND REPTILIA OF SOUTHEAST ASIA,
Naval Medical Research Unit No 2 Taipei (Taiwan)
Gwilym S. Jones. 1969, 30p Rept no. NAMRU-2-SP-16
Availability: Pub. in Quarterly Jnl. of the Taiwan Museum, v22 n1/2 p91-120 Jun 69.

Descriptors: (*Reptiles, Bibliographies), (*Amphibians, Bibliographies), Southeast Asia, Taiwan, Reports, Scientific research.

A bibliography for the vertebrate classes Amphibia and Reptilia of Southeast Asia is presented. Though an attempt was made to include as many references as possible, the list is not considered complete. The area considered as Southeast Asia is encompassed by a line extending from Burma to Taiwan, south to the Philippines, and west to Sumatra. Some works from adjacent areas have been included because of faunal overlap.
AD-698 102

PRELIMINARY IDENTIFICATION MANUAL FOR MAMMALS OF SOUTH VIETNAM.
Medical research interim rept.,
Smithsonian Institution Washington D C

Peter F. D. Van Peenen, Paul F. Ryan, and Rudolph H. Light. Dec 69, 319p* NAVMED-M4305.12-3004-8

Descriptors: (*Mammals, *Vietnam), Classification, Morphology (Biology), Distribution, Identification, Bibliographies, Handbooks.
Identifiers: *Taxonomic keys, South Vietnam.

The manual contains descriptions and keys for identification of all wild mammals known or strongly suspected to occur in South Vietnam. Scientific names, author citations, common names, appearances, external measurements, descriptions and measurements of skulls, and locality records are given for each species. There are drawing of mammals and/or skulls for many species. The Gazetter, list of references, and index are provided. (Author)
AD-698 196 HC$3.00 MF$0.65

CLINICAL LABORATORY VALUES OF BEAGLE DOGS,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Farrel R. Robinson, and Ralph F. Ziegler. 1968, 12p Rept no. AMRL-TR-66-210
Availability: Pub. in Laboratory Animal Care, v18 n1 p39-49 Feb 68.

Descriptors: (*Medical examination, *Dogs), Physical fitness, Statistical analysis, Blood chemistry, Hematology, Males, Females, Tables, Measurement.
Identifiers: Beagles.

Clinical laboratory data from 202 newly purchased beagle dogs (101 each males and females-813 samples) were analyzed for means and standard deviations. Some statistical differences in values between males and females were found but appear to be of little practical significance, since variation between dogs is rather high. These data have been very useful in our laboratory in determining whether clinical laboratory results on newly purchased beagles from commercial sources fall within normal ranges and in entering this and other relevant data in the Termatrex system. As a guideline, the mean plus and minus 2 standard deviations has been used as the normal range for all measurements. (Author)
AD-698 218

A-BAND OSMIOPHILIA, ITS MICROSCOPIC DEMONSTRATION WITH SILVER.
Technical rept. Sep 65-Jul 67,
Edgewood Arsenal, Md.
Brian Schofield, Jacob Y. Terner, Jacob Lundy, and John H. Thompson. Nov 67, 18p EA-TR-4142
Distribution Limitation now Removed.

Descriptors: (*Muscles, *Histological techniques), (*Biological stains, Muscles), (*Osmium compounds, Biological stains), Tetroxides, Visual inspection, Electron microscopy, Silver, Muscle proteins, Amines, Microscopy.
Identifiers: *Osmium oxides, Hexamethylenetetramine.

The relatively specific affinity of osmium tetroxide (OsO_4) for the A-bands, or myosin-containing areas, of striated and cardiac muscle from goats and rabbits is demonstrated. A silver-methenamine (Ag-Me) reagent was used so that this A-band osmiophilia could be identified by electron and light microscopy. Histochemical reactions indicate that the OsO_4 forms a partially reduced complex with the amino and/or guanido groups of the A-band protein through coordinate covalent bonds. This partially reduced complex then reduces the Ag-Me reagent as it itself is oxidized. The reduced silver precipitates along the muscle A-band, giving a selective stain for that muscle component at the electron or light microscopic level. The presence of OsO_4 in the A-bands was also verified by reducing the osmium to a black compound with sulfurous acid and phenylenediamine and by forming a red complex of osmium with alpha-naphthylamine. (Author)
AD-825 251 HC$3.00 MF$0.65

THE APPLICATION OF NUCLEAR ENERGY TO AGRICULTURE.
Inter-American Inst. of Agricultural Sciences, Turrialba (Costa Rica).
For primary bibliographic entry see Field 2D.
For abstract, see NSA 23 23.
NYO-2043-194 HC$3.00 MF$0.65

USE OF SOLAR ENERGY FOR MASS CULTURE OF ALGAE.
l'Utilisation de l'Energie Solaire Par les Cultures Accelerees D'algues
Association Francaise pour L Etude Et le Developpement des Applications de L Energie Solaire, Paris.

1969, 53P
Lang- in French Conf- Proc. of A Meeting of the Soc. Franc. des Thermiciens, Paris, 13 Feb. 1969

Descriptors: *Algae, *Conferences, *Culture techniques, *Growth, Carbon dioxide, Chlorella, Cost estimates, Diets, Photosynthesis, Scenedesmus.

For abstract, see STAR 07 24.
N69-40762 HC$3.00 MF$0.65

FRENCH EXPERIMENTS - CULTURE OF SPIRULINE OR BLUE ALGAE.
les Realisations Francaises - La Culture de La Spiruline, Algue Bleue
Institut Francais Du Petrole, Paris (France).
H. Van Landeghem. 1969, 13p
Appl. Energie Solaire Use of Solar Energy for Mass Culture of Algae 1969 (See N69-40762 24-04) Coll- 13 P Lang- in French

Descriptors: *Blue green algae, *Culture techniques, *France, Algae, Carbon dioxide, Growth, Mexico, Photosynthesis.

For abstract, see STAR 07 24.
N69-40765 HC$3.00 MF$0.65

DEVELOPMENT OF SUPPORT AND RESTRAINT TECHNOLOGY.
Northrop Corporate Labs., Hawthorne, Calif.
C. F. Lombard, G. L. Potter, and W. A. Robbins.
Apr 69, 96p NASA-CR-106384, AMRL-TR-68-136
Contract F33615-67-C-1651
Date- Apr. 1969 Coll- 96 P Refs Spon- Supported in Part By Nasa

Descriptors: *Constraints, *Guinea pigs, *Impact acceleration, *Support systems, *Systems engineering, Lethality, Physiological acceleration, Velocity distribution.

For abstract, see STAR 07 24.
N69-40779 HC$3.00 MF$0.65

EXTRATERRESTRIAL LIFE DETECTION BY ENZYMATICALLY INDUCED EXCHANGE OF O-18 ANNUAL REPORT, 15 MAY 1968 - 15 MAY 1969.
Martin Marietta Corp., Baltimore, Md. Research Inst. for Advanced Studies.
For primary bibliographic entry see Field 6A.
For abstract, see STAR 07 24.
N69-41322 HC$3.00 MF$0.65

PARTICIPATION OF TRACE ELEMENTS IN BIOCHEMICAL PROCESSES CONNECTED WITH BIOSYNTHESIS OF PROTEINS IN PLANTS,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
For primary bibliographic entry see Field 2A.
PB-187 972T HC$3.00 MF$0.65

BIOCHEMISTRY OF MOLYBDENUM,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
For primary bibliographic entry see Field 2A.
PB-187 973T HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ETHYLENE.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 069 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF AEROALLERGENS (POLLENS).
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 076 HC$3.00 MF$0.65

6D. Bionics

CONCEPT FORMULATION AS A BASIS FOR PATTERN RECOGNITION,
Clemson Univ S C Dept of Electrical Engineering
Robert W. Snelsire. 1969, 15p
Contract N00014-69-C-0232
Presented at the Annual IEEE Region III Convention (8th), Huntsville, Alabama, 19-21 Nov 69.

Descriptors: (*Pattern recognition, Programming (Computers)), Game theory, Classification, Mathematical models, Learning.

The problem of designing computer programs which will approach human capabilities in pattern recognition is discussed. The fact that human beings are very good at recognizing patterns which are highly structured and very bad at recognizing patterns which are not is contrasted with the fact that the performance of computer systems is almost independent of the amount of structure in the patterns. It is then suggested that those visual concepts are developed by human beings which are useful for solving the structured pattern recognition problem. To gain insight into the way these visual concepts may be programmed, a simple game playing environment is proposed in which the winning patterns may be changed. A program will then be written which will perform as nearly as possible the way humans do -- well for structured patterns and badly for unstructured ones. A computer program to implement this game has been written and is briefly discussed, but the main purpose of this paper is to point out directions for research which may prove fruitful in solving some of the many difficult problems in pattern recognition. (Author)
AD-697 973 HC$3.00 MF$0.65

CYBERNETICS AND TECHNICAL PROGRESS,
Joint Publications Research Service, Washington, D.C.
V. M. Glushkov. 1 Dec 69, 24p
Trans. from Radyanska Ukrayina (USSR) p3-4, 16 Sep 69.

Descriptors: (*Cybernetics, USSR), Management engineering, Communication systems, Construction, Economics, Predictions, Technical information centers, Industries, Agriculture, Programming (Computers), Computer personnel.
Identifiers: Management information systems.
JPRS-49352 HC$3.00 MF$0.65

METHODOLOGICAL PROBLEMS OF MODELING NEURON STRUCTURES (Metodologicheskie Voprosy Modelirovaniya Neironykh Struktur),
Joint Publications Research Service, Washington, D.C.
N. V. Pozin. 5 Dec 69, 18p
Trans. of Voprosy Filosofii (USSR) v23 n8 p85-96 1969.

Descriptors: (*Nerve cells, Models (Simulations)), Brain, Psychophysiology, Nervous system, Physiology, Electrophysiology, Bionics, Cybernetics, USSR.

The nervous stystem is the most significant of a number of life systems for studying the principles of control, the principles of information conversions which have been developed by animate nature over the course of long years of evolution. The nervous system is of special interest because it is this system which is responsible for the operational control of the organism in its complex interaction with the external environment. Because of this, the nervous system, or brain, of the living organism has become an object of study not only for neurophysiologists, but also for specialists on control problems. The divisions of the brain are being more and more considered not only as different forms of living tissue, but as parts of a complex automatic system under the joint study of physiologists, engineers and mathematicians. The procedures of neurophysiology are being supplemented by other procedures, which have come in recent years to be called cybernetic. The goals of the research are formulated by the problems of control science which sees in the study of the brain a source of new ideas, new principles for the synthesis of automatic equipment. (Author)
JPRS-49384 HC$3.00 MF$0.65

6E. Clinical Medicine

IMMUNOCHEMICAL STUDIES OF HUMAN SALIVA.
Technical rept.,
State Univ of New York Buffalo Dept of Oral Biology
Solon A. Ellison. Sep 67, 17p
Contract Nonr-3970 (00)

Descriptors: (*Saliva, Chemical analysis), (*Immunity, Saliva), Humans, Electrophoresis, Proteins, Secretion, Identification, Immune serums, Antigens+ antibodies, Calcium, Dogs, Stimulation.

The overall strategy in this program comprised the adaptation for use in salivary analysis of a variety of chemical and immunological techniques. Particular stress was given to delineating as precisely as possible the picture obtained by electrophoretic analysis. It was reasoned that for general use, and clinical application, methods as these, which can yield both quantitative and qualitative information, using samples of a reasonable size are most useful. Coupled with this were attempts to isolate individual components, to characterize them, and to prepare specific antiserums suitable for their identification. In addition, since interpretation of clinical findings has to be in physiological as well as biochemical terms, studies of an animal model capable of yielding physiological data concerning protein secretion were begun. (Author)
AD-697 977 HC$3.00 MF$0.65

ON THE NATURE OF THE POSTHYPNOTIC SUGGESTION.
Institute of the Pennsylvania Hospital Philadelphia
For primary bibliographic entry see Field 5J.
AD-697 983 HC$3.00 MF$0.65

ACTIVITIES OF THE REGISTRY OF COMPARATIVE PATHOLOGY,
Armed Forces Inst of Pathology Washington D C
F. M. Garner. 1969, 3p
Availability: Pub. in Bulletin Wildlife Disease Assoc., v5 p319-321 Jul 69.

Descriptors: (*Pathology, Directories), (*Information retrieval, Pathology), Reviews, Reports, Scientific research, Documentation.
Identifiers: *Registry of comparative pathology.

The Registry of Comparative Pathology (RCP) is one of the newer registries of the American Registry of Pathology that are housed in the Armed Forces Institute of Pathology (AFIP), Washington, D. C. 20305. The RCP was established in 1966 and is jointly operated by the Armed Forces Institute of Pathology and the Universities Associated for Research and Education in Pathology, Inc. (UAREP). The objectives of the Registry are to provide a national resource center for the purposes of consultation assistance to scientists working in the broad field of comparative pathology and of obtaining pathologic materials for research and education. Material is being collected from a wide range of species, including nonhuman primates; domestic, laboratory, wild and zoo animals; birds, fish, and, to a limited extent, invertebrates. (Author)
AD-698 002

ADENOID CYSTIC CARCINOMA OF THE BREAST. AN ANALYSIS OF 21 CASES,
Armed Forces Inst of Pathology Washington D C
Francisco J. Cavanzo, and Herbert B. Taylor. 23 May 69, 6p
Availability: Pub. in Cancer, v24 n4 p740-745 Oct 69.

Descriptors: (*Cancer, *Mammary glands), Histology, Pathology, Cells (Biology), Lymphatic system, Neoplasms, Excision, Recovery, Mortality rates.
Identifiers: Adenoid cystic carcinoma.

The clinical and pathologic findings in 21 patients with adenoid cystic carcinoma of the breast are presented. Nineteen of the 21 patients were living and well after treatment. Two patients died of unrelated causes. Local recurrence appeared in only 2 patients, 3 and 7 years following simple excision, but they were free of disease 9 and 14 years after subsequent mastectomy. No clinical or pathologic evidence of lymph node or distant metastasis was found in any of the patients. For these reasons, simple mastectomy is advocated as preferred treatment for adenoid cystic carcinoma, unless the tumor is particularly large or there are enlarged axillary lymph nodes. The favorable prognosis of patients with adenoid cystic carcinoma of the breast is in sharp contrast to that of patients with histologically identical tumors in other sites. Possible explanations for this striking difference in behavior are discussed. (Author)
AD-698 003

RADIOLOGIC-PATHOLOGIC CORRELATION OF THE MONTH FROM THE ARMED FORCES INSTITUTE OF PATHOLOGY,
Armed Forces Inst of Pathology Washington D C
Maurice M. Reeder. Aug 69, 7p
Availability: Pub. in Radiology, v93 n2 p427-433 Aug 69.

Descriptors: (*Intestines, Digestive system diseases), (*Digestive system diseases, Diagnosis), X rays, Blood chemistry, Biopsy, Histology, Pathology, Blood proteins, Infections.
Identifiers: Dysgammaglobulinemia, Nodular lymphoid hyperplasia.

This month's RPC features the recently described syndrome of (1) dysgammaglobulinemia with decrease in level of IgG and virtual absence of IgA and IgM immunoglobulins in the serum, (2) nodular lymphoid hyperplasia of the small intestine, (3) an increased susceptibility to infections, usually respiratory, (4) diarrhea, often with steatorrhea, and (5) the almost invariable presence of Giardia lamblia in the stools. The radiographic appearance of numerous tiny uniform 1 to 3 mm nodular lesions within the small intestine and occasionally the right colon is quite characteristic and should suggest the diagnosis. Laboratory studies, including immunoelectrophoresis, malabsorption tests, stool examinations, and small bowel biopsy, are confirmatory. The possible role of the immunoglobulin deficiency and giardiasis in contributing to the diarrhea and malabsorption seen in these patients is discussed. (Author)
AD-698 006

MALIGNANT MIXED TUMORS OF SALIVARY GLAND ORIGIN,
Armed Forces Inst of Pathology Washington D C
Ronald M. Gerughty, Henry H. Scofield, Francis M. Brown, and Gordon R. Hennigar. 17 Apr 69, 17p
Availability: Pub. in Cancer, v24 n3 p471-486 Sep 69.

Descriptors: (*Cancer, *Salivary glands), Neoplasms, Histology, Diagnosis, Pathology, Sex, Aging (Physiology), Lungs, Central nervous system, Bone, Lymphatic system.
Identifiers: Metastases.

One hundred and thirty-four salivary gland tumors originally diagnosed as malignant mixed tumor at the Armed Forces Institute of Pathology and the Medical College of South Carolina were analyzed. These were reclassified and only 25 were found to possess specific histopathologic criteria necessary for the diagnosis of malignant mixed tumor. Where possible, the clinical behavior, therapy, and prognosis were correlated with the histopathology. The malignant mixed tumor was found primarily in the parotid gland and was observed more frequently in men. The median age of patients with this tumor was 38 years (60% occurred prior to age 40). Pain and fixation of the tumor could not be correlated with malignancy. Sixty-four percent of these tumors presented as primary malignant mixed tumors. Histologically proven metastases were observed in 71% of the cases, with lung, lymph node, central nervous system, and bone the most frequent sites. Certain histopathologic features of the malignant mixed tumor can be correlated with eventual metastases. Although the pathogenesis of the malignant mixed tumor remains undetermined, the results of this study indicate that this neoplasm is malignant from the onset and does not develop from malignant transformation of a preexisting 'benign' mixed tumor. (Author)
AD-698 007

THE FUTURE OF HEALTH CARE DELIVERY.
Brooke Army Medical Center Fort Sam Houston Tex

1969, 108P*
Presented at the United States Army-Baylor University Program in Health Care Administration Preceptor's Course, 9-11 Apr 69.

Descriptors: (*Public health, Predictions), Medicine, Dentistry, Management planning, Medical research, Education, Hospitals, Medical personnel.

Contents: Future health care delivery systems; Expectations in dental care; The nurse in future health care delivery systems; Medical education in the future; Professionalism in health care administration; Future education of the health care administrator; Future roles of the physician in health care delivery systems; A graduate curriculum for the future; The art of preceptorship.
AD-698 033 HC$3.00 MF$0.65

INVESTIGATION ON FILARIASIS IN THAILAND.
Progress rept. no. 3 (Final), 1 Apr 68-31 Mar 69,
University of Medical Sciences Bangkok (Thailand) Bangkok School of Tropical Medicine
Chamlong Harinasuta, Supat Sucharit, Pensri Guptavanij, Tongchai Dessin, and Kamhang Suratin. Mar 69, 82p
Grant DA-MD-49-193-66-G9208

Descriptors: (*Filariae, Diseases), (*Thailand, Filariae), Nematodes, Parasites, Culicidae, Larvae, DDT, Epidemiology, Chemotherapeutic agents, N-heterocyclic compounds.
Identifiers: *Diethylcarbamazine, *Filariasis.

A pilot project for the control of Malayan filariasis - mass treatment with diethylcarbamazine at a dose of 5 mgm per kgm body weight once weekly for six weeks was applied to the people of village no. 2 of Kanchanadit District, Surathani Province, South Thailand. The microfilarial positive rate was 21.1

percent and elephantiasis 5.3 percent in the population of about 1000. The causative parasite was nocturnal periodic B. Malayi and there were no animal reservoir hosts. Blood examinations were repeated one month and one, two, three, five and six years after the treatment. Spraying all the houses in the village with DDT, according to the malaria eradication project in Thailand, was also performed once a year. It was found that the incidence of microfilaria-carriers decreased from 21.1 to 0.9 percent, the filariasis infection rate from 26.1 to 6.4 percent, and the mean microfilarial density of all films from 4.8 per 20 cc blood to 0.02. Dissections of the mosquitoes which were performed along with the blood examinations (one month and one, two, three, five and six years after the mass therapy) revealed that only the state II larvae of B. Malayi were found in two M. uniformis caught in the second year after the mass treatment. (2) Malayan filariasis in Chumporn Province, (3) Bancroftian filariasis in Sangkla-Buri District, and (4) skin tests, other portions of the study are reported. (Author)
AD-698 042 HC$3.00 MF$0.65

HEMORRHAGIC SHOCK AND ADRENAL CORTEX.
Progress rept. no. 2 (Annual), 1 Jul 68-30 Jun 69,
Boston Univ Mass School of Medicine
Richard H. Egdahl. Sep 69, 34p
Contract DADA17-67-C-7149

Descriptors: (*Adrenal cortex, *Shock (Pathology)), Pathology, Physiology, Blood circulation, Kidneys, Metabolism, Insulin, Hormones, Corticosteroid agents, Growth, Histology, Hemorrhage.

A method for the study of the microcirculatory pattern of the adrenal gland is described. In control animals there is a uniform appearance of the cortical vasculature. In hemorrhagic shock vasoconstruction in the pre-capillary arterioles of the capsular plexus occurs, resulting in a patchy gross appearance of the cortex. Microscopically numerous segments of the cortical capillary bed did not receive the injection material suggesting relative non-perfusion of these areas. The kidney plays a quantitatively major role in the metabolism of insulin and growth hormone; most of the removal occurs by degradation in the renal tissue, and not by urinary excretion. There is a constant relationship between the arterial hormone concentration and the renal arterio-venous hormone difference over a wide range of concentrations. The renal arterio-venous difference of insulin and growth hormone in acute hemorrhagic shock, studies over a wide range of arterial concentrations, is the same in magnitude as in the control studies. Differences in concentration in aortic and portal venous blood of dogs and monkeys showed clearance of corticosteroid by the gut. Percentage of corticosteroid removed was higher in animals during shock than in controls. There was a linear relationship between the amount removed and arterial corticosteroid concentrations. (Author)
AD-698 044 HC$3.00 MF$0.65

RELATIVE EFFECTIVENESS OF SELECTED SPACE FLIGHT DECONDITIONING COUNTERMEASURES,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Michael McCally, Shirley A. Pohl, and Plummer A. Samson, Jr. 1968, 14p Rept no. AMRL-TR-67-26
Availability: Pub. in Aerospace Medicine, v39 n722-734 Jul 68.

Descriptors: (*Space flight, *Stress (Physiology)), Protection, Blood plasma, Levarterenol, Urine, Excretion, Responses, Temperature, Tolerances (Physiology), Hormones, Pressure breathing, Humans.

Head out neutral temperature (34 degrees C) water immersion of human subjects produces diuresis, plasma volume contraction, decreased urinary norepinephrine excretion and subsequent orthostatic intolerance. Similar responses have been reported after prolonged manned space flight. Six protective techniques or countermeasures, including: (1) four extremity venous tourniquets or cuffs, (2) an elastic leotard, (3) antidiuretic hormone (ADH) injection, and (4) cold immersion (30-31 degrees C), were assayed for their ability to alter or prevent these immersion responses. Chair rest, bed rest and bed rest with lower body negative pressure (LBNP) were studied as non-immersion controls. Venous blood and urine were collected in six subjects every two hours during each eight hour exposure. The elastic leotard donned after immersion, just prior to tilt, was the most effective measure tested and restored tilt table responses to control level ($p < 0.01$). Four extremity venous tourniquets, inflated two minutes on and four minutes off, offered no protection but in a one minute on and one minute off cycle, significantly ($p < 0.05$) increased urinary norepinephrine excretion and decreased the maximum heart rate response to the post-immersion tilt. Cold significantly increased urinary norepinephrine excretion during immersion but did not prevent post-immersion orthostatic tachycardia. Antidiuretic hormone administration prevented the immersion diuresis but was without effect on subsequent tilt table tolerance. These observations may be pertinent to the prevention of the orthostatic intolerance seen after prolonged manned space flight. (Author)
AD-698 048

SEROLOGIC SPECIFICITY OF HUMAN ANTI-IgA AND ITS SIGNIFICANCE in tranfusion,
California Univ Los Angeles School of Medicine
G. N. Vyas, L. Holmdahl, H. A. Perkins, and H. H. Fudenberg. 1969, 9p
Contract Nonr-3656 (12), Grant PHS-HE-07494
Availability: Pub. in Blood, v34 n5 p573-581 Nov 69.

Descriptors: (*Gamma globulin, Antigens+ antibodies), (*Antigens+ antibodies, Blood transfusions), Serodiagnosis, Immunology.

Anti-IgA antibodies detected by a passive hemagglutination assay are either specific for the IgA class or they are of limited specificity. Persons lacking IgA can produce class-specific anti-IgA as a result of parenteral exposure to incompatible IgA globulin in blood and its components. In contrast, persons with normal levels of IgA may produce anti-IgA of limited specificity. Either type of anti-IgA antibodies was present in 86 per cent of anaphylactoid and urticarial transfusion reactions. A majority of these antibodies are of the IgG class. (Author)
AD-698 063

NEW CONCEPTS IN FACIAL BONE HEALING AND GRAFTING PROCEDURES,
Naval Medical Research Inst Bethesda Md
Henry E. Richter, and Philip J. Boyne. 1969, 5p
NAVMED-M4305.05-3021A-1
Availability: Pub. in Jnl. of Oral Surgery, v27 p557-559 Jul 69.

Descriptors: (*Bone, *Healing), (*Transplantation, Bone), Surgical techniques, Labeled substances, Histology, Regeneration, Face, Dentistry, Tissues (Biology).

Sophisticated laboratory experiments related to bone repair have led to an evaluation of the most advantageous bone grafting technics as they relate to bone healing. The use of autogenous hematopoietic bone marrow grafts, independently and combined with homogenous bone, is discussed. (Author)
AD-698 069

MICROEMISSION SPECTROCHEMICAL ANALYSIS OF HUMAN LUNGS FOR BERYLLIUM,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Farrel R. Robinson, Solomon F. Brokeshoulder, Anthony A. Thomas, and J. Cholak. 10 Aug 67, 7p
Rept no. AMRL-TR-67-22
Availability: Pub. in American Jnl. of Clinical Pathology, v49 n6 p821-825 Jun 68.

Descriptors: (*Beryllium, *Respiratory diseases), (*Histological techniques, Beryllium), Spectroscopy, Lasers.
Identifiers: *Berylliosis, *Spectrochemical spectroscopy, Emission spectroscopy.

Microemission spectrographic techniques were used to analyze histologic sections of fixed embedded and frozen tissues from human cases of berylliosis. The primary advantages of this technique are (1) small biopsy and fixed embedded tissues can be analyzed for beryllium, and (2) the beryllium can be identified in specific microscopic structures or areas. (Author)
AD-698 220

MEDICAL INDOCTRINATION FOR FLYERS. AN AEROMEDICAL HANDBOOK FOR AIRCREWS.
Amended ed.
Advisory Group for Aeronautical Research and Development, Paris (France).

1963, 110p AGARD-411-Amend.
NATO furnished.

Descriptors: (*Aviation medicine, *Handbooks), Physiology, Physical fitness, Hypoxia, Hyperventilation, Decompression sickness, Stress (Physiology), Temperature, Vision, Noise.

This Aeromedical Handbook is designed to provide aircrews with a more complete understanding of the biological sciences affecting present-day flying. It is not an exhaustive treatment of all the aeromedical factors and aircrews should discuss any questions arising with their own Flight Surgeons. The material is taken almost verbatim from Royal Canadian Air Force Pamphlet 69, 'Fit to Fly,' with minor deletions and additions. (Author)
N64-19922 HC$3.00 MF$0.65

BIOMEDICAL APPLICATIONS OF NASA SCIENCE AND TECHNOLOGY QUARTERLY PROGRESS REPORT, 15 DEC. 1968 - 14 MAR. 1969.
Research Triangle Inst., Durham, N. C.
For primary bibliographic entry see Field 6B.
For abstract, see STAR 07 24.
N69-40089 HC$3.00 MF$0.65

BLOOD TRANSFUSION PROBLEMS. DISTRIBUTION OF TRANSFUSED LEUKOCYTES AND BONE MARROW CELLS IN THE ORGANS AND TISSUES OF THE RECIPIENT'S BODY,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
A. V. Ilyukhin, G. I. Kozinets, and G. V. Sukyasyan. 15 Oct 69, 10p NIH-10-22-69
Trans. of Problemy Gematologii i Perelivaniya Krovi (USSR) v8 n7 p46-51 1963, by Z. Knowles.

Descriptors: (*Blood transfusions, *Leukocytes), Bone marrow, Cells (Biology), Distribution, Radiation sickness, Therapy, Viability, USSR.

A study of the distribution of transfused leukocytes and bone marrow cells in the recipient's body has great significance for an understanding of the mechanism of transfusing leukocytes and bone marrow cells in treating radiation sickness and other hypoplastic and aplastic conditions of the hematopoiesis. In the distribution of the transfused cells of the white series two stages are observed. The first stage is linked with the entrapment of the majority of the cells introduced into the capillary system of the lungs as the organ with the best developed capillary system. The leukocytes that have lost viability are already destroyed at this stage of their distribution. Viable cells then enter

into the subsequent stage of distribution. The leukocytes are recirculated into the blood stream and are redistributed through the organs and tissues of the body (Secondary deposit); the less viable cells are destroyed; the viable ones function and may be used as reserve by the organism.
PB-187 975T HC$3.00 MF$0.65

THE CHRONIC UREMIA PROGRAM.
Annual rept.,
Blood Research Inst., Inc., Jamaica Plain, Mass.
Calvin A. Saravis. 1969, 15p
Contract PH-43-66-476

Descriptors: (*Blood proteins, Kidneys), (*Kidneys, Dialysis), (*Mechanical organs, Kidneys), Diseases, Therapy, Immunology, Antigens+ antibodies, Electrophoresis.
Identifiers: *Artificial kidneys.

This report contains data of investigations regarding the extent and nature of human plasma protein changes after contact with artificial kidneys in a dialysis program. The qualitative and quantitative immunochemical techniques used are the most precise and sensitive indicators of change in plasma proteins. Initial application of these techniques to the plasma of patients undergoing dialysis for support of defective kidneys has indicated that substantial change in plasma proteins occurs during the dialysis procedure. It is clinically significant that denaturation of the plasma proteins occuring during the dialysis period almost certainly influences the immune response of the patient and in addition may affect plasma oncotic pressure and fluid distribution between the vascular and extravascular pools. Patient management, therefore, can be more effective and predictable with precise knowledge of the phenomena which affect the plasma proteins during dialysis. (Author)
PB-188 036 HC$3.00 MF$0.65

EVALUATION OF LOW PROTEIN DIETS IN MAINTENANCE DIALYSIS. DIET IN UREMIA.
Annual rept. 28 Apr 68-27 Apr 69,
California Univ., Los Angeles. Center for Health Sciences.
Milton E. Rubini, James Shinaberger, and Joel Kopple. Apr 69, 49p
Contract PH-43-68-953
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Blood diseases, *Diet), (*Nutrition, Blood diseases), Metabolism, Dialysis, Kidneys, Blood circulation, Blood chemistry, Amino acids, Proteins, Psychometrics, Calcium, Body weight, Uric acid, Tables.

Efforts were divided into five main categories: Hospital and outpatient dietary management of advanced uremia; metabolic balance studies of the effect of protein restriction in uremia; limitation of nitrogenous accumulation in the management of patients maintained on chronic dialysis; metabolic balance studies of protein and amino acid metabolism in patients undergoing chronic dialysis; psychometric evaluation of uremic patients on various days of the dialysis cycle and on two different protein diets. (Author)
PB-188 179 HC$3.00 MF$0.65

SEMIANNUAL PROGRESS REPORT FOR THE PERIOD ENDING JUNE 30, 1969.
California Univ., Los Angeles. Lab of Nuclear Medicine and Radiation Biology.
For primary bibliographic entry see Field 6R.
For abstract, see NSA 23 23.
UCLA-12-724 HC$3.00 MF$0.65

6F. Environmental Biology

A MULTI-SENSOR STUDY OF PLANT COMMUNITIES AT HORSEFLY MOUNTAIN, OREGON,
Kansas Univ Lawrence Center for Research in Engineering Science
Rex M. Peterson, G. Ross Cochrane, Stanley A. Morain, and David S. Simonett. 1969, 33p Rept no. CRES-Reprint-133-6
Contract DAAK02-68-C-0089
Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.
Availability: Pub. in Remote Sensing in Ecology, p63-94 1969. PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Plants (Botany), Ecology), (*Ecology, Multiband spectral reconnaissance), Density, Trees, Grasses, Mountains, Sensors, Acclimatization, Soils, Terrain, Classification, Altitude, Photographic images, Colors, Data processing systems, Aerial photographs, Color television, Television display systems, Oregon.
Identifiers: *Remote sensing, Vegetation, *Plant communities, Horsefly Mountain (Oregon).

The Horsefly Mountain region is a complex of upland pine and fir forests and of near-flat, stony basins supporting grass or sage. It is an excellent area for vegetation analysis, providing distinct boundaries between communities of very different life-form including grass, low sage shrub, taller chaparral shrub, low tree woodlands and tall tree forests. In addition, important differences within communities, especially variations in height, layering and density partly induced by man's activities. The diverse plant communities discussed occur with a wide range of sharply to diffusely-defined boundaries and with a wide range of densities within communities. The region thus lends itself well to the testing of image-combining devices now being used in vegetation studies. The IDECS system, which is an Image Discrimination, Enhancement, Combination, and Sampling device used, produces color images by combining data from up to six black and white multi-sensor images. (Author)
AD-698 098

INVESTIGATIONS ON STERILIZATION BY IRRADIATION FOR THE CONTROL OF THE SOUTH-AMERICAN FRUIT FLY, ANASTREPHA FRATERCULUS (WIED).
Estaction Experimental Agricola de la Molina, Lima (Peru).
For primary bibliographic entry see Field 6R.
For abstract, see NSA 23 23.
NYO-3989-2 HC$3.00 MF$0.65

FIELD EXPERIMENTS ON THE FLUX OF RADIONUCLIDES THROUGH A SALT MARSH ECOSYSTEM.
Progress rept.,
Georgia Univ., Athens. Dept. of Zoology.
L. R. Pomeroy, E. P. Odum, R. J. Reimold, R. D. Jones, and L. R. Shenton. 25 Sep 69, 24p
Contract AT (40-1)-3238

Descriptors: (*Swamps, Ecology), (*Ecology, Radioactive isotopes), Radioactive fallout.

For abstract, see NSA 23 23.
ORO-3238-7 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF PESTICIDES.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 091 HC$3.00 MF$0.65

BIOLOGICAL EFFECTS OF OIL POLLUTION-BIBLIOGRAPHY. A COLLECTION OF REFERENCES CONCERNING THE EFFECTS OF OIL ON BIOLOGICAL SYSTEMS.
Water pollution control research series,
Federal Water Pollution Control Administration, Washington, D.C.
Donna R. Radcliffe, and Thomas A. Murphy. Oct 69, 52p* DAST-19 W70-02038

Descriptors: (*Water pollution, *Oils), Ecology, Marine biology, Aquatic animals, Plants (Botany), Birds, Biology, Neoplasms, Animals, Bibliographies.
Identifiers: *Oil pollution.

References on the biological effects of oil are listed according to the following categories: Publications on the General Aspects of Oil Pollution, Reports of Oil Spill Incidents, General Biological Effects of Oil and of Specific Oil Spill Incidents, Effects of Oil on Birds, Effects of Oil on Fish, Effects of Oil on Shellfish, Effects of Oil on Freshwater Invertebrates, Effects of Oil on Plants, Effects of Oil on Dissolved Oxygen, Carcinogenic Effects of Oil, and Miscellaneous Biological Reports on Oil. (Author)
PB-188 206 HC$3.00 MF$0.65

6G. Escape, Rescue, and Survival

INJURY POTENTIAL OF EJECTION SEAT CUSHIONS,
Wyle Labs Rockville Md Payne Div
For primary bibliographic entry see Field 1B.
AD-697 886

6H. Food

PRESERVATION FISH BY IONIZING RADIATION: AN ANNOTATED BIBLIOGRAPHY,
Oak Ridge National Lab., Tenn.
F. J. Weiss, F. E. McKinney, and L. M. Frye. Sep 69, 129p*
Contract W-7405-eng-26

Descriptors: (*Irradiated foods, *Fishes), (*Bibliographies, Irradiated foods), Preservation.

For abstract, see NSA 23 23.
ORNL-IIC-25 HC$3.00 MF$0.65

DOSIMETRY, TOLERANCE, AND SHELF LIFE EXTENSION RELATED TO DISINFESTATION OF FRUITS AND VEGETABLES BY GAMMA IRRADIATION.
Annual rept. 1 Jun 67-31 May 68,
Hawaii Univ., Honolulu. Coll. of Tropical Agriculture.
E. K. Akamine, J. L. Brewbaker, I. Buddenhagen, D. Kinch, and J. Moy. Sep 69, 182p*
Contract AT (04-3)-235

Descriptors: (*Radiation effects, *Fruits), (*Vegetables, Radiation effects), (*Irradiated foods, Radiation effects), Gamma rays, Dose rate, Storage.

For abstract, see NSA 23 23.
UH-235-P-5-4 HC$3.00 MF$0.65

6J. Industrial (Occupational) Medicine

AIR POLLUTION ASPECTS OF HYDROCHLORIC ACID.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 067 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF HYDROGEN SULFIDE.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 068 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF NICKEL AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 070 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ARSENIC AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 071 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ZINC AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 072 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF PHOSPHORUS AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 073 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF MERCURY AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 074 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF CHROMIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 075 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF SELENIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 077 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF BERYLLIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 078 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF MANGANESE AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 079 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ASBESTOS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 080 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ALDEHYDES.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 081 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF AMMONIA.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 082 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF BARIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 083 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF BORON AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 085 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF CADMIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 086 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF CHLORINE GAS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 087 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF IRON AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 088 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ODOROUS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 089 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ORGANIC CARCINOGENS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 090 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF RADIOACTIVE SUBSTANCES.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 092 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF VANADIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 093 HC$3.00 MF$0.65

6K. Life Support

THE EFFECT OF WATER VAPOR ON THE LiOH-CO2 REACTION. PART I. DYNAMIC ISOTHERMAL SYSTEM,
Naval Research Lab Washington D C
For primary bibliographic entry see Field 7B.
AD-698 118 HC$3.00 MF$0.65

DETERMINATION OF TRACE QUANTITIES OF HALOGENATED HYDROCARBONS IN GAS SAMPLES,
Naval Research Lab Washington D C
For primary bibliographic entry see Field 7D.
AD-698 120 HC$3.00 MF$0.65

SUBJECTIVE ANALYSIS OF SPEECH IN HELIUM ENVIRONMENTS,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Charles W. Nixon, and Henry C. Sommer. 1968, 7p
Rept no. AMRL-TR-67-42
Availability: Pub. in Aerospace Medicine, v39 n2 p139-144 Feb 68.

Descriptors: (*Controlled atmospheres, Helium), (*Helium, Speech transmission), (*Speech, Intelligibility), Space crews, Frequency, Masking, Vocoders, Communication equipment, Sound pitch, Sound transmission, Space flight, Simulation.

The paper presents a review of speech communication in aerospace environments in which helium is used as a component of the life-sustaining atmosphere. Some physical and psychoacoustical factors that comprise speech in helium concentrations of 0 to 80 per cent and at pressures of 760 to 258 mm. Hg are defined. (Author)
AD-698 222

LABORATORY OF AEROSPACE MEDICINE.
Laboratoire de Medecine Aerospatiale
Techtran Corp., Glen Burnie, Md.
Sep 69, 67p NASA-TT-F-12462
Contract NASW-1695
Coll- 67 P Tran- Transl. Into English From French Paper

Descriptors: *Aerospace medicine, *France, *Research facilities, Human factors engineering, Laboratories, Man machine systems, Test facilities.

For abstract, see STAR 07 24.
N69-40594 HC$3.00 MF$0.65

EVALUATION OF DESORBATES FROM A REGENERATIVE CARBON DIOXIDE REMOVAL SYSTEM USED IN A 60-DAY MANNED TEST.
Mcdonnell-douglas Astronautics Co., Santa Monica, Calif. Advance Biotechnology and Power Dept.
P. P. Mader, R. A. Neustein, and M. L. Rodin. Oct 69, 35p NASA-CR-106214, MDC-G1192
Contract NASW-1539

Descriptors: *Carbon dioxide removal, *Desorption, *Life support systems, *Manned space flight, *Regeneration (engineering), Flight simulators, Metabolic wastes, Space stations.

For abstract, see STAR 07 24.
N69-40777 HC$3.00 MF$0.65

BIOCHEMICAL AND METABOLIC EFFECTS OF A SIX- MONTH EXPOSURE OF SMALL ANIMALS TO A HELIUM- OXYGEN ATMOSPHERE.
Union Carbide Corp., Tonawanda, N. Y. Linde Div. Research Lab.
J. D. Cohen, G. F. Doebbler, L. F. Exposito, R. W. Hamilton, Jr., and J. M. King. Oct 69, 90p NASA-CR-1372
Contract NAS2-3900
Coll- 90 P Refs

Descriptors: *Biochemistry, *Controlled atmospheres, *Helium, *Metabolism, *Mice, Oxygen consumption, Tissues (biology).

For abstract, see STAR 07 24.
N69-40955 HC$3.00 MF$0.65

6L. Medical and Hospital Equipment

IN VIVO BUBBLE DETECTION BY ACOUSTIC-OPTICAL IMAGING TECHNIQUES,
Naval Medical Research Inst Bethesda Md
Richard G. Buckles, and Cameron Knox. 10 Mar 69, 7p NAVMED-M4306.02-2070B-1
Revision of report dated 23 Dec 68.
Availability: Pub. in Nature, v222 n5195 p771-772, 24 May 69.

Descriptors: (*Decompression sickness, *Hamsters), (*Bubbles, Detection), Lasers, Ultrasonic radiation, Images, Sound signals, Optical images, Biophysics.

The onset of bubble formation in deep tissues of a hamster exposed to a simulated dive can be detected usually with acoustic-optical imaging. A technique is described that permits detection of bubbles prior to the onset of physiological symptoms normally observed in the hamster. (Author)
AD-698 088

A MONOLITHIC IMAGE SENSOR FOR A READING AID FOR THE BLIND.
Technical rept.,
Stanford Univ., Calif. Stanford Electronics Labs.
Phillip J. Salsbury. Jul 69, 142p* SU SEL-69-037, TR-4828-1
Sponsored in part by Department of Health, Education, and Welfare, Washington, D.C. and Office of Education, Washington, D.C.

Descriptors: (*Blindness, *Reading), (*Integrated circuits, *Photoelectric cells (Semiconductor)), Piezoelectric effect, Optical scanning, Sensors, Interference.

A novel optical-tactile reading aid giving a blind person immediate access to virtually all printed material used by sighted people has been developed, which occupies a volume approximately equal to that of an ordinary desk-size dictionary. A singular feature of this instrument is a silicon monolithic image-sensing array that serves as the 'retina' of the reading aid. Signals from the retina are used to control an array of piezoelectric stimulators that form tactile images of printed characters. The image sensor consists of a 144-element matrix of bipolar phototransistors integrated on a silicon chip approximately 2 x 4 mm in size. The order (24 x 6) and aspect ratio (2:1) of the array are determined by the resolution and field-of-view requirements of the reading aid, which in turn depend on printed-character dimensions, short-term human memory, tactile-stimulator size, and index-finger dimensions. A column-isolated structure maximizes the active photosensing area, and a one-dimensional scanning technique minimizes spurious outputs and reduces the complexity of the total system. (Author)
PB-186 324 HC$3.00 MF$0.65

A COMPUTERIZED BLOOD INVENTORY SYSTEM IN THE SERVICE OF THE COMMUNITY, THE BLOOD DONOR AND THE PATIENT-RECIPIENT.
Community Blood Council of Greater New York, N.Y.
For primary bibliographic entry see Field 9B.
PB-188 002 HC$3.00 MF$0.65

NEW SYNTHETIC MEMBRANES FOR THE DIALYSIS OF BLOOD.
Annual technical progress rept. no. 3, 5 May 68-4 Jun 69,
Stanford Research Inst., Menlo Park, Calif.
Donald J. Lyman, John L. Brash, Rodney D. Hamilton, Sharon K. Brauman, and Bruce K. Fritzinger. Jun 69, 69p*
Contract PH-43-66-493
See also Annual technical progress report no. 2, PB-179 172.

Descriptors: (*Membranes, Dialysis), (*Dialysis, Blood), (*Mechanical organs, *Kidneys), Polymers, Polyester plastics, Epoxy plastics, Isocyanate plastics, Peptides, Permeability, Interactions.
Identifiers: *Artificial kidneys, Hemodialysis.

The development of new synthetic polymers that could act as 'partition' membranes for the dialysis of blood was studied. The synthetic work has been primarily devoted to three polymer systems: Copolyether-hydrocarbons, graft copolymers, and polypeptides. In attempts to produce copolyether-hydrocarbon systems, both anionic and free radical techniques were employed. Surface grafts of N-vinylpyrrolidone onto polyethylene and polytetrafluoroethylene tubing have been prepared at ambient temperatures and in the presence of air. The chemistry of amino acid-copper (II) complexes has been investigated as a potential route to monomers suitable for the preparation of new polypeptide membranes.
PB-188 031 HC$3.00 MF$0.65

DEVELOPMENT OF A NEW CONCEPT IN MEMBRANE STRUCTURE FOR APPLICATION IN HEMODIALYSIS.
Annual progress rept. no. 2, 1 Jun 68-31 May 69,
North Star Research and Development Inst., Minneapolis, Minn.
R. J. Petersen, and L. T. Rozelle. 2 Jul 69, 53p*
Contract PH-43-67-1160
See also Annual progress rept. no. 1, PB-179 215.

Descriptors: (*Dialysis, Membranes), (*Membranes, Polymers), (*Mechanical organs, *Kidneys), Medical laboratories, Films, Experimental data, Porosity, Compatibility, Mixtures, Etching, Separation, Nylon, Nitrocellulose, Cellulose acetates, Heat transfer, Electrical properties, Infrared equipment, Physical properties, Laboratory equipment.
Identifiers: Ultrathin membranes, *Hemodialysis, *Artificial kidneys.

Data gathered on three types of dialysis cells under widely varied conditions has consistently shown superior dialysis performance of ultrathin cellulose membranes compared to Cuprophan over a range of solutes up through 5000 molecular weight. The requirement of a membrane support material such as cloth or paper has been detrimental on membrane performance, lowering it to the same range as Cuprophan in some specific cases, so that improvement in support materials is needed. Membranes can be stored or transported in a dry state with no detriment to dialysis performance and even with improvement in solute permeabilities. (Author)
PB-188 034 HC$3.00 MF$0.65

FEASIBILITY STUDY ON THE USE OF ULTRASONIC ENERGY TO INCREASE HEMODIALYSIS RATES.
Final rept. 14 Jun 67-30 Sep 68,
IIT Research Inst., Chicago, Ill.
S. D. Howkins. 28 Oct 68, 75p IITRI-J6125-3
Contract PH-43-67-1350
See also PB-176 337.

Descriptors: (*Mechanical organs, *Kidneys), (*Dialysis, Blood), (*Ultrasonic radiation, Dialysis), Feasibility studies, Membranes, Fluid flow, Hemolysis, Diffusion, Model tests, Permeability.
Identifiers: *Hemodialysis, *Artificial kidneys.

An analysis to estimate the optimum conditions for ultrasonic enhancement of hemodialysis was made. Experimental measurements were extended to include the effects of very high amplitude (40g) low frequency (5c/s to 5Kc/s) vibrations on dialysis rate. Also, after a preliminary study of acoustic streaming in narrow channels, a section of a dialyzer was constructed as a prototype of a real ultrasonically enhanced kidney machine in which high frequency sound was focussed in the blood channel. Measurements of the effects of sound on dialysis rate were made for different solutes and membranes. The results of this program indicate that increases in dialysis rate of up to 50% can be achieved for blood channels of a thickness of .015' with blood flow rates of 250ml/min. with 'Visking' membranes. Greater improvements could be obtained with more permeable membranes where the boundary layer represents a high percentage of the overall resistance to mass transfer. The results of in vitro and in vivo studies on human blood showed that virtually no damage was produced by ultrasonic irradiation under the conditions used to enhance dialysis.
PB-188 035 HC$3.00 MF$0.65

HEARING AID PERFORMANCE MEASUREMENT DATA AND HEARING AID SELECTION PROCEDURES CONTRACT YEAR 1970.
Information bulletin.
Veterans Administration, Washington, D.C.

1969, 329p* IB-10-124
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $2.50.
Errata sheet inserted.

Descriptors: (*Deafness, Earphones), (*Government procurement, Earphones), (*Earphones, Performance (Engineering)), Reliability (Electronics), Selection, Contracts, Test methods, Statistical analysis, Experimental data, Classification, Auditory signals, Electrical properties, Gain, Power, Electrical industry.
Identifiers: Production models, Manufacturers, Bids, Evaluation, *Hearing aids.

Contents: Copy of bid solicitation format for contract year 1970; Description of statistical procedures used in the evaluation of hearing aid performance; Chart showing name of manufacturer solicited, models submitted for test program, type of hearing aid and designation of those selected for contract year 1970; List showing average gain, average maximum power output and performance scores for each model tested; Raw test data obtained on each of three sample instruments for each model submitted.
PB-188 054 MF$0.65

STUDIES ON THE DEVELOPMENT OF MATERIALS FOR USE IN ARTIFICIAL HEART DEVICES.
Annual rept. no. 4, 1 Nov 67-30 Sep 68,
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
G. A. Grode, S. Anderson, and R. D. Falb. 30 Oct 68, 87p
Contracts PH-43-64-496, PH-43-68-649

Descriptors: (*Mechanical organs, *Heparin), (*Plastic coatings, Heparin), Polymers, Blood plasma, Ammonium compounds, Chlorides, Plasma medium, Chemical bonds, Complex compounds, Blood coagulation, In vivo analysis, In vitro analysis, Silicones, Halohydrins, Hydrazine derivatives, Heart.
Identifiers: *Mechanical hearts, *Blood compatible materials, Ammonium/methyl-tridodecyl, Quaternary ammonium salts, *Surface chemistry, Epichlorohydrin.

Studies on the blood-foreign surface interface centered on the interactions of blood platelets and proteins with heparinized surfaces. In order to determine the extent of platelet interaction, four different indices of platelet function were studied after exposure of platelets to test surfaces. These studies included measurements of ADP release, platelet factor III release, acid phosphatase release, and clot retraction. The work on protein adsorption on heparinized and control surfaces was extended to the use of radiolabeled proteins in whole plasma. Work with Factor IX-deficient plasma in contact with heparinized surfaces indicated no

preferential adsorption of Factor IX. The effect of heparinized and control surfaces on protein denaturation was monitored by measuring the activities of several plasma enzymes. In vivo data collected at Battelle and by other collaborators indicates the tridodecylmethyl ammonium chloride (TDMAC) treatment is highly successful in producing nonthrombogenic surfaces. Another approach to facile heparinization centered on Hydrin rubber, which through its inherent amino groups can be heparinized by direct treatment with a heparin solution. The use of radiofrequency excited gas plasmas for the attachment of amine groups to a variety of materials has produced surfaces capable of absorbing 4 to 180 A thick layers of heparin. Several derivatives of heparin have been prepared. The derivatives include: a cyanuric chloride adduct, a linoleic ester of heparin, a heparin hydrazide, a silylated derivative of heparin, and an ethylenimine adduct.
PB-188 108 HC$3.00 MF$0.65

STUDIES ON THE DEVELOPMENT OF MATERIALS FOR USE IN ARTIFICIAL HEART DEVICES.
Annual rept. no. 5, 1 Oct 68-30 Sep 69,
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
G. A. Grode, S. Anderson, and R. D. Falb. 30 Oct 69, 122p
Contract PH-43-68-649
See also Annual rept. no. 4, PB-188 108.

Descriptors: (*Mechanical organs, *Heparin), (*Plastic coatings, Heparin), Polymers, Blood plasma, Blood coagulation, Ammonium compounds, Chlorides, Surface properties, In vivo analysis, Heart, In vitro analysis, Silicones, Chemical bonds, Amines, Complex compounds, Styrene plastics, Plasticizers.
Identifiers: *Mechanical hearts, *Blood compatible materials, *Surface chemistry, Ammonium/methyltridodecyl, Quaternary ammonium salts.

Discussed is work on the development of the preparation of thromboresistant materials which has progressed to a point where it is possible to attach heparin either ionically or covalently to the surfaces of materials as well as throughout the bulk of the materials. For example, heparin may be covalently attached to silicone rubber using sebacoyl chloride under anhydrous conditions. The studies of interface phenomena occurring between heparinized surfaces, and blood indicate that the interactions are limited in many cases to an initial equilibration. Interactions between tridodecylmethyl ammonium chloride (TDMAC) modified surfaces and plasma lipids and lipoproteins are manifested by an initial drastic reduction in lipid and lipoprotein content. Similar preliminary tests on plasma contacted with surfaces modified using a closely related heparin binding agent, tetradodecyl ammonium bromide (TDAB), indicate no adverse interactions with lipids or lipoproteins. Analyses of heparinized surfaces prepared by styrene grafting, chloromethylation, amination and heparinization show removal of clotting factor deficiencies in only the intrinsic pathway. The effect of specific chemical groups on interactions between plasma components and surfaces has been investigated. In general, those surfaces containing free amine groups appear to produce the most dramatic and damaging effects on blood elements. A large number of materials and devices were heparinized for in vivo evaluation by several laboratories across the country. The majority of results indicated that the TDMAC method has considerable potential for short term heparinization. (Author)
PB-188 111 HC$3.00 MF$0.65

COMPATIBILITY OF BLOOD WITH MATERIALS USEFUL IN THE FABRICATION OF ARTIFICIAL ORGANS.
Annual progress rept. 23 Jun 68-23 Sep 69,
Cordis Corp., Miami, Fla.
S. P. Halbert, M. Anken, and A. E. Ushakoff. 1 Oct 69, 138p
Contract PH-43-66-980

Descriptors: (*Mechanical organs, *Heparin), (*Plastic coatings, Mechanical organs), (*Blood coagulation, *Plastics), Elastomers, Blood plasma, Silicones, Acrylic resins, Vinyl plastics, Halocarbon plastics, Proteins, Epoxy plastics, Sulfonates.
Identifiers: *Blood compatible materials, *Mechanical hearts, Ammonium/methyltridodecyl, Quaternary ammonium salts, Polycarbonate resins, Tetrafluoroethylene resins.

The effects of various implantable materials on plasma protein have been investigated. Silicone rubber was compatible with plasma, but silicone rubber which had been heparinized by means of quaternary ammonium salts produced profound turbidity of the plasma. Polyurethane similarly heparinized produced the same effects. These were found to be due almost exclusively to denaturation of the lipoproteins. Study demonstrated that it was not the heparin on the surface of the plastic, but the quaternary ammonium salt which brought about the destructive changes. Silicone rubber heparinized by a different technic (via an aminoorganosilane covalently bonded to the silica particles) was inert to plasma proteins. Epoxy resin and heparinized epoxy resins brought about changes in certain enzyme activities. A carbon surface, polycarbonate, and several acrylamide surfaces proved relatively inert toward plasma proteins. Sodium carboxylate acrylic acid indefinitely prolonged clotting times at 24 and 48 hours. Lithium carboxylate acrylic acid exposed plasma became quite turbid, and appreciable protein insolubilization occured. Magnesium carboxylate acrylic acid, on the other hand, only caused some deterioration of the clotting mechanism. No significant changes were observed with the silicone rubber elastomers, vinylsulfonic acid, acrylic acid or sodium sulfonate vinylsulfonic acid. (Author)
PB-188 117 HC$3.00 MF$0.65

BODY FLUIDS ANALYSES PROGRAM.
Progress rept., 1 Mar-31 Aug 69,
Oak Ridge National Lab., Tenn.
Charles D. Scott. Dec 69, 91p ORNL-TM-2779

Descriptors: (*Body fluids, Analysis), Automation, Chromatographic analysis, Digital computers, Instrumentation, Colorimetric analysis, Urine, Cerebrospinal fluid, Perspiration, Blood serum, Carbohydrates.

Automated, high-resolution analytical systems are being developed for use in the clinical laboratory. At present, techniques are being studied that will result in the determination of large numbers of the molecular constituents in body fluids, particularly organic compounds of low molecular weight. Two separate analytical systems are being investigated: an analyzer for detecting and quantifying UV-absorbing constituents (UV-analyzer), and an analyzer for detecting and quantifying carbohydrates (carbohydrate analyzer), in body fluids. Emphasis is now being placed on evaluating prototype systems of both types of analyzers, on developing miniaturized versions of each, and on identifying the molecular constituents of normal and abnormal body fluids. (Author)
PB-188 130 HC$3.00 MF$0.65

HEMODIAFILTRATION: EVALUATION OF A NEW APPROACH TO THE PURIFICATION OF UREMIC BLOOD THROUGH SIMULTANEOUS ULTRAFILTRATION AND FLUID RECONSTITUTION.
Annual Progress rept. no. 2, 8 Mar 68-7 Mar 69,
Pennsylvania Univ., Philadelphia. School of Medicine.
Lee W. Henderson. Mar 69, 12p
Contract PH-43-67-109

Descriptors: (*Blood, Purification), (*Kidneys, Blood), Filters (Fluid), Proteins, Hemolysis, Membranes (Biology), Dialysis, Mechanical organs.
Identifiers: Ultrafiltration, Artificial kidneys.

Work has clarified the interrelationships between ultrafiltration rate and the design variables of channel height, length, blood path pressure drop and transmembrane ultrafiltration pressure. While clinical diafiltration is feasible from the engineering standpoint, UM-10 membrane in a modified scale-up of the flow through prototype now in hand, the device would require an inordinately large amount of membrane. In addition to the drawback of large size and substantial priming volume, is the potential problem of excessive adsorptive protein loss. Further work will be required to establish the biological feasibility of this technique. (Author)
PB-188 155 HC$3.00 MF$0.65

THE DESIGN AND TESTING OF A NARROW CHANNEL LAMINAR FLOW HEMODIAFILTER (THE DIAPHRON).
Annual rept. no. 2,
Amicon Corp., Lexington, Mass.
Lita Nelsen. 10 Feb 69, 105p
Sponsored in part by Pennsylvania Univ., Philadelphia. School of Medicine. Contract PH-43-67-109.

Descriptors: (*Blood, *Liquid filters), (*Mechanical organs, *Kidneys), Laminar flow, Design, Purification, Membranes, Mass transfer, Standards.
Identifiers: *Hemodiafilters, *Artificial kidneys, Design criteria.

The ability of Diaflo ultrafiltration membranes to provide the requisite high flux rates and molecular size discrimination to allow practical blood purification by hemodiafiltration was satisfactorily demonstrated. The major limitation on design of a low membrane area hemodiafilter is still the reduction in flux through the membrane caused by the concentration polarization of protein molecules at the membrane surface. A satisfactory model, believed to be generally applicable to all blood and plasma ultrafiltration processes was developed, which qualitatively and quantitatively predicts the fluxes resulting from this polarization. From this model, design criteria for a full-scale hemodiafiltration unit were developed, and the need for ultrathin channels to reduce the required membrane area was demonstrated. (Author)
PB-188 156 HC$3.00 MF$0.65

6M. Microbiology

PLANETARY QUARANTINE PROGRAM QUARTERLY PROGRESS REPORT.
Sandia Corp., Albuquerque, N. Mex. Planetary Quarantine Dept.

Sep 69, 48p NASA-CR-106475, QPR-14
NASA ORDER W-12853

Descriptors: *Microorganisms, *Planetary quarantine, *Spacecraft sterilization, Clean rooms, Lunar topography, Models, Project management, Thermal radiation, Viking lander spacecraft.

For abstract, see STAR 07 24.
N69-41103 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF BIOLOGICAL AEROSOLS (MICROORGANISMS).
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 084 HC$3.00 MF$0.65

CONTINUOUS MICROBIOLOGICAL PURIFICATION OF WASTE-WATER FROM PAPER AND WALLBOARD INDUSTRIES,
Acta Polytechnica Scandinavica, Stockholm (Sweden).
Ivar H. Sanick, and Gunnar Sjostrom. 1969, 34p*, APS-CH-86
Pub. by the Royal Swedish Academy of Engineering Sciences, Stockholm, Sweden. Paper copy also available from: Acta Polytechnica Scandinavica Publishing Office, Box 5073, Stockholm 5 (Sweden) Sw.kr. 10.00.

Descriptors: (*Paper industry, Wastes (Industrial)), (*Wastes (Industrial), Purification), (*Fungi, Wastes (Industrial)), Metabolism, Enzymes, Carbohydrates, Wood, Water, Sweden.
Identifiers: *Coniophora cerebella.

The fast growing strain of Coniophora cerebella called 'G' and isolated (I.S.) by ultra sound treatment of a suspension of the original strain of C. cerebella, has proved to tolerate extreme environmental conditions. After more than 4 years the G-strain has not shown any tendency to degenerate in the presence of other soil micro-organisms. With the faster growth and spread it is not surprising to find that also the sclerotia formed quicker than with the original strain. The sclerotium formed has been closer investigated by micro-photography of frozen sections. Growing on different kinds of wood it was found that the C. cerebella G will grow twice as fast on cross-cuts of pine as on cross-cuts of common birch. Tests with waste-water have shown that in practice nothing is to be gained by adjusting the original pH-values prior to the enzymatic break-down on fibres and dissolved carbohydrates. In purification tests of waste-water the pH will rise from 3.8 to 5.9 after a flow distance of 72 m over bed. The BOD of waste-water after purification and correction for water evaporation had dropped from 2150 mg/l to 234 mg/l after a flow distance of 104 m over bed. The corresponding drop in COD was from 5590 mg/l to 517 mg/l. (Author)
PB-188 194 HC$3.00 MF$0.65

6O. Pharmacology

EFFECT OF NOREPINEPHRINE ON MYOCARDIAL METABOLISM BEFORE AND AFTER BETA RECEPTOR BLOCKADE,
Loyola Univ Hines III Stritch School of Medicine
V. V. Glaviano, and T. N. Masters. 16 Apr 69, 9p
Contracts Nonr-3502 (01), PHS-HE-08682
Revision of report dated 28 Jan 69.
Availability: Pub. in European Jnl. of Pharmacology, v7 p135-142 1969.

Descriptors: (*Levarterenol, *Heart), Metabolism, Inhibition, Carbohydrates, Sympatholytic agents, Concentration (Chemistry), Dogs, Fatty acids, Blood pressure.

Cardiac beta-adrenergic receptors were stimulated by the infusion of 0.02 micrograms/min/kg of norepinephrine (NE) into the left circumflex coronary artery in 20 anesthetized, bilaterally vagotomized open chest dogs. NE increased myocardial extraction ratio and uptake of glucose, lactate and plasma unesterified fatty acids (FFA). The increase in metabolism was accompanied by a slight rise in peak intraventricular pressure and a significant increase in dp/dt. Mean blood pressure, coronary artery perfusion pressure, coronary flow and coronary vascular resistance were not altered. In 10 of 20 degs treated with the beta-adrenergic receptor blocking drug, dl-propranolol, the intracoronary infusion of NE caused moderate decreases in the uptake of lactate and pyruvate, while that of glucose was not significantly altered. FFA uptake was markedly decreased from 12.7 plus or minus 3.3 to 1.0 plus or minus 2.3 microEq/min/100 g while the extraction ratio declined 58% from control. Myocardial glycogen concentration in 8 control dogs was found to be not significantly different from cardiac glycogen levels in dogs infused with NE before and after beta-receptor blockade. These data indicated that the myocardial uptake of FFA in dogs pretreated with propranolol was not stimulated by subsequent administration of NE, suggesting that FFA utilization by the normal heart is closely associated with the cardiac beta-adrenergic receptor. (Author)
AD-697 885

SYNTHESIS AND CHARACTERIZATION OF 2-ETHYL-3-HEXANOL para-HYDROXYBENZOATE,
Fort Detrick Frederick Md
John W. E. Brown. Nov 69, 30p* Rept no. SMUFD-Technical manuscript-552

Descriptors: (*Benzoates, Synthesis (Chemistry)), (*Antibiotics, Benzoates), Benzoic acids, Molecular isomerism, Spectra (Infrared), Thin layer chromatography, Gas chromatography, Spectra (Visible+ ultraviolet), Bacteria, Stereochemistry.
Identifiers: *Benzoic acid/hydroxy, Benzoic acid/hydroxy- ((hydroxy-methyl)heptyl-ester), Skin protective agents.

2-Ethyl-3-hexanol p-hydroxybenzoate was synthesized and characterized by infrared and ultraviolet spectroscopy and thin-layer (TLC) and gas-liquid chromatography (GLC). These methods proved the existence of stereoisomers and allowed the prediction of preferred conformations. The RR and SS enantiomers had a higher boiling point, a lower retention value on TLC, and were eluted faster on GLC than the RS and SR diastereoisomers. The ester exhibited antimicrobial activity against gram-positive bacteria and yeast, but not against gram-negative bacteria. The ester also exhibited sunscreen properties and was not toxic to animals. (Author)
AD-698 026 HC$3.00 MF$0.65

IMMUNOCHEMICAL STUDIES ON COBROTOXIN,
Kaohsiung Medical Coll (Taiwan) Dept of Biochemistry
C. C. Chang, and C. C. Yang. 23 Dec 68, 11p
ARDG (FE)-J-262
Grant DA-crd-afe-s92-544-68-g124
Availability: Pub. in Jnl. of Immunology, v102 n6 p1437-1444 Jun 69.

Descriptors: (*Reptiles, Venoms), (*Venoms, *Toxins+ antitoxins), Antigens+ antibodies, Molecular weight, Taiwan.
Identifiers: *Cobrotoxin.

Cobrotoxin, the crystalline toxic protein obtained from Formosan cobra venom, is immunochemically homogeneous and was proved to be the main toxic protein in the venom. One hundred per cent precipitable antibody was isolated immunospecifically by gel filtration on Sephadex G-100 after the antigen-antibody complexes had been dissociated with 0.53 M formic acid-0.15 M NaCl, pH 2.05. The specific neutralizing capacity of the purified antibody was 17.5 greater than that of the antisera. The purified antibody was digested with papain and the univalent fragments formed soluble antigen-antibody complex with the homologous antigen. An estimate of the molecular weight of the soluble complex formed from cobrotoxin and Fragment 1 indicated that cobrotoxin consists of three antibody-combining sites/molecule. (Author)
AD-698 064

PICOLINALDEHYDE, 5 - HYDROXY - THIOSEMICARBAZONE, (NSC-107 392): DETERMINATION OF TOXICITY IN DOGS.
Supplementary rept. no. 2,
Mason Research Inst., Worcester, Mass.
George R. Thompson, Ulrich H. Schaeppi, Robert W. Fleischman, David A. Cooney, and Ruth D. Davis. 15 Nov 69, 54p
Contract PH-43-65-51
See also Basic report, PB-183 370, and Supplementary Rept. no. 1, PB-184 149.

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Dosage, Toxic tolerances, Blood chemistry, Hematology, Histology, Pathology, Dogs, Bone marrow, Body weight, Aldehydes, Tables, Pharmacology, Chlorpromazine, Pyridines, Aldehydes.
Identifiers: *Picolinaldehydes, Picolinaldehyde/hydroxy-thiosemicarbazone, Semicarbazone/thio.

For determination of MTD, dogs (2 per dose level) were treated for 5 consecutive days with 43.5, 21.75, 10.8 or 5.2 mg/kg of Picolinaldehyde (Table 1). No mortalities occurred in this study. To prevent Picolinaldehyde - induced emesis, two dogs treated at the highest dose (43.5 mg/kg/day) were pretreated with Chlorpromazine 8 mg/kg or 4 mg/kg respectively 45 minutes prior to each Picolinaldehyde injection. Both doses of Chlorpromazine reduced the incidence of emesis approximately 50% from that of dogs treated with the same Picolinaldehyde dose but receiving no Chlorpromazine. Six dogs were not pretreated with Chlorpromazine. Two each received 21.75, 10.8 or 5.2 mg/kg of Picolinaldehyde. At these low doses, toxicity was not dose related. Predominant toxicity included leukopenia (5/6), vomiting (5/6), diarrhea (4/6), weight loss (5/6), anemia (3/6), and decreased serum Cl- (3/6). At least one animal at each dose level displayed toxic symptoms, but no consistent pathological changes were found at autopsy. Both dogs treated with 21.75 mg/kg showed bone marrow hypoplasia. The other 4 dogs exhibited no drug related pathology. Five consecutive daily I.V. injections with 5.2 mg/kg appeared to be acceptable as the MTD. (Author)
PB-188 006 HC$3.00 MF$0.65

6P. Physiology

A DETERMINATION FOR THE NAVY OF ZERO HEARING LEVEL FOR SPEECH.
Memorandum rept.,
Naval Submarine Medical Center Groton Conn Submarine Medical Research Lab
James F. Willott. 25 Jul 69, 9p Rept no. SMRL-MR-69-7 NAVMED-M4305.08-3003D-01

Descriptors: (*Auditory perception, *Thresholds (Physiology)), Naval research, Submarine personnel, Aptitude tests, Phonetics, Speech, Audiometry, Military requirements.
Identifiers: Phonetically balanced words, Monosyllables.

Twenty-three normal-hearing candidates for the Submarine Force were examined for Speech Reception Threshold (SRT) by speech audiometry using phonetically-balanced (PB) lists of monosyllables instead of the usual spondee words. Such PB words are felt to be considerably better in assessing the important frequency regions for daily speech communication, namely, 500-2000 cycles per second. The Navy threshold for SRT (PB) is 25 db sound pressure level re 0.0002 dyne/sq cm, or 6 db higher than the standard SRT (Spondees). A standard speech audiometer, now calibrated for spondees according to USA Standards Institute specifications, can then be used with the PB lists by subtracting 6 db from the Hearing Level dial reading to arrive at the particular subject's SRT (PB). (Author)
AD-697 932 HC$3.00 MF$0.65

SOME COMPARISONS BETWEEN VISUAL AND AUDITORY NEUROPHYSIOLOGY,
Naval Submarine Medical Center Groton Conn Submarine Medical Research Lab
J. Donald Harris, and Russell L. Sergeant. 2 Sep 69, 14p* Rept no. SMRL-592 NAVMED-MF12.524.004-9010D-04

Descriptors: (*Sensory mechanisms, Theory), Visual perception, Auditory perception, Correlation techniques, Nervous system, Sensitivity, Cerebral cortex, Nerve cells, Data processing systems, Thresholds (Physiology), Electrical properties, Sensory deprivation, Laboratory animals, Naval research.
Identifiers: Neurophysiology, Receptors (Physiology), Stimulus (Psychophysiology), Bioelectricity.

A number of concepts and facts from the vision domain are of interest and value to otologists. Not only the similarities but also the differences between the two sensory systems are enlightening. The paper discusses the similar ranges of sensitivity to quanta of energy and the biological mechanisms whereby the physical stimuli are transformed logarithmically, coding of the physical stimulus by

single cells in the optic and the auditory nerves, principles of neural integration in the brainstem and midbrain nuclei, the point-to-point relationship between cortical activity and certain aspects of the physical stimulus, the eye and ear as channels of information, and cross-modality facilitation and inhibition.
AD-697 952 HC$3.00 MF$0.65

THE IMPACT OF MODERNIZATION IN THE PHILIPPINES.
Pennsylvania State Univ University Park
For primary bibliographic entry see Field 5K.
AD-697 981 HC$3.00 MF$0.65

TILT TABLE RESPONSE OF HUMAN SUBJECTS FOLLOWING APPLICATION OF LOWER BODY NEGATIVE PRESSURE,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 6S.
AD-698 010

NEW CONCEPTS IN FACIAL BONE HEALING AND GRAFTING PROCEDURES,
Naval Medical Research Inst Bethesda Md
For primary bibliographic entry see Field 6E.
AD-698 069

THE PSYCHOPHYSICAL DIMENSIONS OF SIMILARITY AMONG RANDOM SHAPES,
Antioch Coll Yellow Springs Ohio Behavior Research Lab
Herbert H. Stenson. 4 Nov 67, 15p AMRL-TR-67-131
Contract F33615-67-C-1280
Availability: Pub. in Perception and Psychophysics, v3 (3B) p201-214 1968.

Descriptors: (*Visual perception, Geometric forms), (*Decision making, Psychophysics), Set theory, Display systems, Performance tests, Statistical processes, Correlation techniques, Factor analysis, Configuration, Students.
Identifiers: Stimulus (Psychophysiology), Random shapes, Similarity judgments.

Six psychological dimensions were recovered from similarity judgments of 20 random forms using a nonmetric scaling technique. These were related to 10 physical factors describing the forms by using canonical correlation analysis and rotations of the resulting vectors. Four factors accounting for 2/3 of the variance of the intersection of the physical and psychological spaces for subjects are described as complexity, curvature, curvature dispersion, and straight-length dispersion. The problem of the proper psychological distance metric is discussed, and individual differences among Ss are analyzed. The results lead to the conclusion that the four major factors found may be good representations of processes occurring in the perceptual system. (Author)
AD-698 070

EFFECT OF STIMULUS SIZE, DURATION, AND RETINAL LOCATION UPON THE APPEARANCE OF COLOR,
Naval Submarine Medical Center Groton Conn Submarine Medical Research Lab
Donald O. Weitzman, and Jo Ann S. Kinney. 1 Aug 68, 8p Rept no. SMRL-606 NAVMED-MF12.524-004-9013D-05
Revision of report dated 7 Jul 67.
Availability: Pub. in Jnl. of the Optical Society of America, v59 n5 p640-643 May 69.

Descriptors: (*Color vision, Analysis), (*Retina, Responses), Illumination, Colors, Time, Peripheral nervous system, Blindness, Naval research, Visual signals.
Identifiers: Visual field, Tritanopia, Foveal fision, Stimulus (Psychophysiology), Deuteranomaly, Colorless vision.

The names given to special visual stimuli from 480 to 610 mmu and to a white-light test stimulus were obtained, using two diameters of stimulus fields. The experiment was designed to test the hypothesis that normal color vision is replaced by tritanopic vision in all parts of the retina if the total luminous energy is sufficiently reduced. The results obtained with four observers confirm the presence of tritanopia when small, brief stimuli are viewed foveally, but fail to confirm it in the periphery. Reduced color vision in the periphery is apparently characteristic of deuteranomaly, which ends ultimately in colorless vision. These results are discussed as giving support to the notion that foveal tritanopia is due to the depressed sensitivity of the blue receptor mechanism found in the central fovea. (Author)
AD-698 087

A FACTOR ANALYSIS OF FIGURAL-MEMORY ABILITIES.
Technical rept.,
University of Southern California Los Angeles Psychological Lab
Paul A. Bradley, Ralph Hoepfner, and Paul J. Guilford. Jun 69, 30p Rept no. 43
Contract Nonr-228 (20)
Report on Studies of High-Level Personnel.

Descriptors: (*Visual perception, Intelligence tests), (*Memory, Performance (Human)), Factor analysis, Configuration, Display systems, Aptitude tests, Theory, Test construction (Psychology), Statistical processes, Naval research, Students.
Identifiers: Figural memory abilities, Structure of intellect theory, Cognition.

The main interest in the study was the six visual-figural-memory abilities hypothesized from structure-of-intellect theory. Those abilities were to be demonstrated as distinct from one another and from ten other abilities by means of 26 new tests designed for the figural-memory abilities, and 24 marker tests for the reference factors for the other abilities. (Author)
AD-698 137 HC$3.00 MF$0.65

EFFECTS OF MICROWAVES AND RADIO FREQUENCY ENERGY ON THE CENTRAL NERVOUS SYSTEM,
Randomline Inc Willow Grove Pa
Allan H. Frey. 17 Sep 69, 10p
Contract N00014-69-C-0181
Presented at the Public Health Service 'Symposium on the Biological Effects and Health Implications of Microwave Radiation', Richmond, Va., 17-19 Sep 69.

Descriptors: (*Central nervous system, Radiation effects), (*Radiation effects, Radiofrequency), Microwaves, Nerve cells, Nerve impulses, Medical research, USSR, Modulation, Very low frequency, Very high frequency, Ultrahigh frequency, Heart, Endocrine glands, Physiology, Mathematical models, Shock (Pathology).

The history of research in this area is briefly sketched, sources of misunderstanding and confusion are identified, the writer's own experimentation is briefly outlined, and critical matters that an experimenter must recognize are defined. (Author)
AD-698 195 HC$3.00 MF$0.65

DIETARY REGULATION OF GLYCOLYTIC ENZYMES. IV. DIFFERENTIAL HORMONAL EFFECTS IN MALE AND FEMALE RAT JEJUNUM,
Army Medical Research and Nutrition Lab Denver Colo
For primary bibliographic entry see Field 6A.
AD-698 208

ABSOLUTE JUDGEMENTS OF SIZE IN A RESTRICTED VISUAL ENVIRONMENT,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
William C. Steedman. 17 Mar 67, 7p Rept no. AMRL-TR-66-86
Availability: Pub. in Perceptual and Motor Skills, v24 p731-736 1967.

Descriptors: (*Visual perception, Accuracy), Visual acuity, Decision making.

The study is concerned with the ability of human subjects to make absolute judgments of physical size; the visual angle of a stimulus in an otherwise stimulus-free visual field was the subjects only cue. (Author)
AD-698 217

VIBRATORY STIMULATION OF THE SKIN BY ELECTROSTATIC FIELD: EFFECTS OF SIZE OF ELECTRODE AND SITE OF STIMULATION ON THRESHOLDS,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Thomas J. Moore. 21 Feb 67, 7p Rept no. AMRL-TR-67-20
Availability: Pub. in American Jnl. of Psychology, v81 n2 p235-240 Jun 68.

Descriptors: (*Electrophysiology, Skin), (*Skin, Stimulation), Thresholds (Physiology), Vibration, Sensitivity, Arms, Hands.

The vibratory sensitivity of the skin was studied by means of an electrostatic force, and the effects of electrode-area and site of stimulation were determined. Electrostatic stimulation provided an effective means of determining vibratory sensitivity of the skin without having the electrode in direct contact with the skin. For both the hand and the arm, the smallest electrode gave the highest thresholds and the two larger electrodes gave lower and similar threshold values. For the finger, variation of electrode-area resulted in little change in threshold. The effects of site of stimulation were, as expected, that the finger was the most sensitive, the hand less so, and the arm least sensitive. The shape of the threshold-frequency function appeared to differ for the three sites and may have partially depended on the mechanical characteristics of the skin at the site of stimulation. (Author)
AD-698 219

ALTERATION OF THE PENETRABILITY OF SKIN.
Final rept. Jul-Dec 66,
Lever Bros. Co., Edgewater, N.J. Research and Development Div.
Leonard J. Vinson, Javier J. Bulgin, Marjorie D. Lehman, Thomas Masurat, and Edward J. Singer. Apr 67, 60p 1B
Contract DA-18-035-AMC-726 (A)
Distribution Limitation now Removed.

Descriptors: (*Skin, Penetration), (*Membranes (Biology), *Lipoproteins), (*Protective treatments, skin), Barrier coatings, Oxidation, Water, Permeability, Wounds+ injuries, Healing, Laboratory Animals, Tolerances (Physiology), Cells (Biology), Differential thermal analysis, Cholesterol, Organic solvents.

Oxidized lipid-protein complexes were investigated as a means of increasing the barrier properties of skin. Membranes were formed from these complexes, and the optimum lipid to protein ratios was from 1 to 2 parts (by weight) protein to 2.5 parts (by volume) lipid. Incorporation of cholesterol in these membranes lowered the water permeability of the membrane to values found for natural stratum corneum. The membranes showed greater resistance to the destructive action of organic solvents than natural stratum corneum. Differential thermal analysis of the membranes indicated that most of the lipids were complexed with protein. Neonatal rat skin, which was damaged by solvent extraction, was treated with various combinations of lipid-protein complexes. Among various combinations tested, mixtures of linoleic acid, corneum cells, and cholesterol were found most effective in

restoring barrier properties to the solvent damaged skin. Evaluation of different materials as possible wound-healing agents were undertaken in a series of studies in guinea pigs. (Author)
AD-816 303 HC$3.00 MF$0.65

EFFECTS OF PROGRAMMED EXERCISE ON SKELETAL DENSITY AND CALCIUM BALANCE DURING HORIZONTAL BED REST OF HEALTHY ADULT HUMAN MALES.
Texas Womens Univ. Research Inst., Denton.
1969, 214P NASA-CR-101958
Contract NAS9-8246

Descriptors: *Bed rest, *Calcium metabolism, *Exercise (physiology), *Human body, *Long term effects, Aerospace medicine, Bones, Calcification, Circadian rhythms, Creatine, Creatinine, Nitrogen, Phosphorus, Urinalysis.

For abstract, see STAR 07 24.
N69-40016 HC$3.00 MF$0.65

THE DESIGN AND CONSTRUCTION OF A THERMAL SYSTEM TO MEASURE SMALL TEMPERATURE CHANGES IN THE BRAIN.
California Univ., Los Angeles. Space Biology Lab.
J. G. Mc Elligott. 1969, 6p NASA-CR-106386
Contract NGR-05-007-195
Conf- Presented At the 7th Temp. Meas. Soc. Conf., Hawthorne, Calif., 21-22 Apr. 1969

Descriptors: *Bioelectricity, *Brain, *Electronic equipment, *Temperature gradients, *Temperature sensors, Cats, Exobiology, Glucose, Neurons, Sensory stimulation.

For abstract, see STAR 07 24.
N69-40603 HC$3.00 MF$0.65

EFFECTS OF SOME BLOOD ANTICOAGULANTS ON THE PHAGOCYTIC FUNCTION OF LEUKOCYTES,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
A. I. Shustov. 15 Oct 69, 5p NIH-10-10-69
Trans. of Problemy Gematologii i Perelivaniya Krovi (USSR) v11 n9 p41-43 1966, by P. DePorte.

Descriptors: (*Anticoagulants, *Phagocytes), Blood, Leukocytes, Heparin, Citric acids, Magnesium compounds, Sulfates, Sodium compounds, Citrates.

An investigation was made of the phagocytic activity of leukocytes of the donor whole blood, stabilized with the anticoagulants the most frequently used in practice (neutral sodium citrate citric acid, magnesium sulfate, heparin). By the degree of negative effect produced on the phagocytic leukocyte function the agents studied are distributed in the following order: citric acid, magnesium sulfate, heparin, neutral sodium citrate. (Author)
PB-187 971T HC$3.00 MF$0.65

MORPHOGENESIS OF CENTRAL CORRELATIONS IN THE DEVELOPMENT OF THE SUCKING REFLEX IN MAN,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
E. L. Golubeva. 20 Oct 69, 4p NIH-10-27-69
Trans. of Vsesoyuzmyi Cezd Anatomov. Gistologov, i Embriologov (6th) Kiev, 1958. Trudy (All-Union Congress of Anatomists, Histologists, and Embryologist (6th) Kiev, 1958. Works), n.p., 1962. v2 p159-161, by Z. D. Knowles.

Descriptors: (*Reflexes, Humans), Embryos, Embryology, Infants, Face, Nerves, USSR.
Identifiers: *Sucking reflexes.

The objective of the study was to determine the characteristics of the morphogenesis of the basic structures which guarantee an adequate sucking action at birth. The sucking reflex of newborn mammals, including those of man, belongs to the number of unconditioned reflexes which develop most fully in the intrauterine life and chiefly terminates at the moment of birth. The nucleus of the facial nerve of man is a mass of terminal motor neurons both for the sucking reflex of the neonate and for all mimic movements of the face of the adult person. The central bundle of the tegmentum is the most important descending tract controlling the nucleus of the facial nerve, apart from the pyramidal tract. Its function consists of the transmission of nerve impulses from the higher extrapyramidal integrating centers to the system of peripheral motor neurons, particularly to the nucleus of the facial nerve. The task of this investigation has consisted of a study of the step-by-step development of the nucleus of the facial nerve and of the formation of connections between this nucleus and the central bundle of the tegmentum in the process of the embryogeny.
PB-187 976T HC$3.00 MF$0.65

LEAST-SQUARES ESTIMATION OF RESPIRATORY SYSTEM PARAMETERS,
Boeing Scientific Research Labs., Seattle, Wash. Information Sciences Lab.
J. S. Meditch, and P. J. Stoll. Aug 69, 28p
Information Sciences-34, D1-82-0891
Grant PHS-HE-05819-02

Descriptors: (*Respiratory system, Experimental data), (*Curve fitting, Least squares method), Mathematical models, Decision making, Carbon dioxide, Simulation.
Identifiers: Parameter estimation.

In the estimation of physiological parameters, visual fitting of experimental data has the obvious drawback that a given 'best-fit curve' is not equally satisfying to every observer. In this paper, an iterative, weighted, nonlinear least-squares method of parameter estimation is formulated. It provides a systematic procedure for the reduction of physiological data and obviates the need for visual fitting which is subjective. The goodness of fit is evaluated in terms of a weighted least-squares error criterion. This method is applied to estimate the parameters of a portion of the human respiratory control system. In particular, the subsystem examined is that relating tidal volume to alveolar CO2 fraction. (Author)
PB-188 029 HC$3.00 MF$0.65

VISUAL CELLULAR STIMULATION BY HIGH ENERGY QUANTA.
A comprehensive rept. 1967-1969,
Florida Univ., Gainesville. Dept. of Opthalmology.
William W. Dawson. 1969, 17p
Contract AT (40-1)-3599

Descriptors: (*Vision, Stimulation), (*X rays, Vision), Eye, Responses.

For abstract, see NSA 23 23.
TID-25195 HC$3.00 MF$0.65

6R. Radiobiology

ANNUAL PROGRESS REPORT ON RESEARCH PROJECT: I. SPONTANEOUS CHROMOSOMAL ABERRATIONS. II. CHROMOSOMAL DAMAGE INDUCED BY X-IRRADIATION,
Brooke General Hospital Fort Sam Houston Tex
For primary bibliographic entry see Field 6C.
AD-698 045 HC$3.00 MF$0.65

EFFECTS OF MICROWAVES AND RADIO FREQUENCY ENERGY ON THE CENTRAL NERVOUS SYSTEM,
Randomline Inc Willow Grove Pa
For primary bibliographic entry see Field 6P.
AD-698 195 HC$3.00 MF$0.65

RADIATION EFFECTS IN BIOCHEMISTRY AND ORGANIC CHEMISTRY.
Technical progress rept., 15 Oct 68-14 Oct 69.
Colorado Univ., Boulder.
1969, 52P
Contract AT (11-1)-690

Descriptors: (*Biochemistry, *Radiation effects), (*Radiation chemistry, *Muramidase), Enzymes, Chemical properties, Physical properties.

For abstract, see NSA 23 23.
COO-690-34 HC$3.00 MF$0.65

FALLOUT PROGRAM QUARTERLY SUMMARY REPORT, JUNE 1, 1969-SEPTEMBER 1, 1969,
New York Operations Office (AEC), N.Y. Health and Safety Lab.
For primary bibliographic entry see Field 18H.
For abstract, see NSA 23 23.
HASL-214 HC$3.00 MF$0.65

FALLOUT PROGRAM QUARTERLY SUMMARY REPORT, JUNE 1, 1969-SEPTEMER 1, 1969.
New York Operations Office (AEC), N.Y. Health and Safety Lab.
For primary bibliographic entry see Field 18H.
For abstract, see NSA 23 23.
HASL-214-APP. HC$3.00 MF$0.65

NEW NEUTRON DOSIMETER AND NEUTRON-SPECTRUM MODEL FOR NUCLEAR ACCIDENT DOSIMETRY,
Oak Ridge Gaseous Diffusion Plant, Tenn.
For primary bibliographic entry see Field 18D.
For abstract, see NSA 23 23.
K-1763 HC$3.00 MF$0.65

INVESTIGATIONS ON STERILIZATION BY IRRADIATION FOR THE CONTROL OF THE SOUTH-AMERICAN FRUIT FLY, ANASTREPHA FRATERCULUS (WIED).
Technical progress rept., Apr-Jun 69,
Estaction Experimental Agricola de la Molina, Lima (Peru).
Juan E. Gonzalez Bachini. 30 Jun 69, 58p
Contract AT (30-1)-3989

Descriptors: (*Pest control, *Radiation tolerance), (*Radiation effects, Musca), Fertility, Eggs, Larvae, Sterilization, Nutrition, Peru.

For abstract, see NSA 23 23.
NYO-3989-2 HC$3.00 MF$0.65

PUERTO RICO NUCLEAR CENTER ANNUAL REPORT, 1968.
Puerto Rico Nuclear Center, Mayaguez.
1968, 178P PRNC-131
Contract AT/40-1/-1833

Descriptors: *Atlantic ocean, *Islands, *Nuclear energy, *Research and development, Health physics, Radiation therapy, Radiobiology.

For abstract, see STAR 07 24.
N69-41246 HC$3.00 MF$0.65

FIELD EXPERIMENTS ON THE FLUX OF RADIONUCLIDES THROUGH A SALT MARSH ECOSYSTEM.
Georgia Univ., Athens. Dept. of Zoology.
For primary bibliographic entry see Field 6F.
For abstract, see NSA 23 23.
ORO-3238-7 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF RADIOACTIVE SUBSTANCES.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.

PB-188 092 HC$3.00 MF$0.65

CALCULATIONS EVALUATING SEVERAL METHODS FOR REDUCING THE RESIDUAL PHOTON DOSE RATE AROUND HIGH-ENERGY PROTON ACCELERATORS.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 20G.
PB-188 101 HC$3.00 MF$0.65

QUESTIONS AND ANSWERS TO THE COLORADO COMMITTEE FOR ENVIRONMENTAL INFORMATION.
Nevada Operations Office (AEC), Las Vegas.
For primary bibliographic entry see Field 18C.
For abstract, see NSA 23 23.
PNE-G-48 HC$3.00 MF$0.65

SIMPLIFIED METHOD FOR CALCULATING NITROGEN-CAPTURE AND FISSION-PRODUCT GAMMA-RAY DOSES INSIDE UNDERGROUND CONCRETE STRUCTURES,
Radiation Research Associates, Inc., Fort Worth, Tex.
For primary bibliographic entry see Field 18F.
For abstract, see NSA 23 23.
RRA-M-71-A-Rev HC$3.00 MF$0.65

RADIATION RESISTANCE OF DROSOPHILA LARVAE.
Three year Comprehensive rept.
San Diego State Coll., Calif.
1969, 59P
Contract AT (04-3)-529

Descriptors: (*Drosophila, Mutations), (*Radiation tolerance, X rays), Larvae.

For abstract, see NSA 23 23.
SAN-529-12 HC$3.00 MF$0.65

VISUAL CELLULAR STIMULATION BY HIGH ENERGY QUANTA.
Florida Univ., Gainesville. Dept. of Opthalmology.
For primary bibliographic entry see Field 6P.
For abstract, see NSA 23 23.
TID-25195 HC$3.00 MF$0.65

SEMIANNUAL PROGRESS REPORT FOR THE PERIOD ENDING JUNE 30, 1969.
California Univ., Los Angeles. Lab of Nuclear Medicine and Radiation Biology.
1969, 87P
Contract AT (04-1)-GEN-12

Descriptors: (*Radiobiology, Reviews), Bibliographies, Nuclear radiation, Radiobiology.

For abstract, see NSA 23 23.
UCLA-12-724 HC$3.00 MF$0.65

PROGRESS REPORT, SEPTEMBER 1, 1968-AUGUST 31, 1969,
Hawaii Univ., Honolulu. School of Medicine.
Louis J. Casarett. 15 May 69, 9p
Contract AT (04-3)-235

Descriptors: (*Radioactive isotopes, Tissues (Biology)), (*Tissues (Biology), Analysis), Distribution, Particle size.

For abstract, see NSA 23 23.
UH-235-P-8-X-2 HC$3.00 MF$0.65

RESPONSE OF UPPER-BODY X-IRRADIATED BEAGLE DOGS TO EXERCISE STRESS.
Master's thesis,
Rochester Univ., N.Y. Dept. of Radiation Biology and Biophysics.
Barbara Ann Martinedes. 1969, 100p

Descriptors: (*Radiation effects, *Stress (Physiology)), Exercise, Partial body irradiation, Dogs.

For abstract, see NSA 23 23.
UR-49-1137 HC$3.00 MF$0.65

6S. Stress Physiology

A STUDY OF WORK-PRODUCING CHARACTERISTICS OF UNDERWATER OPERATIONS AS A FUNCTION OF DEPTH.
Final rept. May-Nov 69,
North American Rockwell Corp Downey Calif Space Div
I. Streimer. 29 Nov 69, 48p Rept no. SD-69-712
Contract N00014-67-C-0363

Descriptors: (*Exercise, *Barometric pressure), (*Diving, Exercise), Metabolism, Performance (Human), Body temperature, Heart, Skin, Respiration, Oxygen consumption, Statistical analysis, Measurement.
Identifiers: Ergometrics.

The effects of alterations in working depth upon the work-producing characteristics of human performing specific underwater manual tasks were examined. The tasks were: (1) A simple, repetitive rotary task requiring continuous torque production against a fixed resistance in a self-paced manner; and (2) A simple, repetitive, discontinuous flexion/extension task requiring the exertion of linear forces against a fixed resistance in a self-paced manner. The work was performed at two depths, 33 and 66 feet in the open ocean. During work sessions, heart rate and three skin temperatures were recorded. Similarly, techniques were employed which allows measurement of mean respiratory flow volumes and oxygen uptake level. The results obtained were examined as functions of task and depth. Statistically significant performance differences were found and related to previous study results. (Author)
AD-697 937 HC$3.00 MF$0.65

PROLIFERATIVE PULMONARY LESIONS IN MONKEYS EXPOSED TO HIGH CONCENTRATIONS OF OXYGEN,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 6T.
AD-698 009

TILT TABLE RESPONSE OF HUMAN SUBJECTS FOLLOWING APPLICATION OF LOWER BODY NEGATIVE PRESSURE,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Michael McCally, Thomas E. Piemme, and Raymond H. Murray. Dec 66, 6p Rept no. AMRL-TR-66-15
Availability: Pub. in Aerospace Medicine, v37 n12 p1247-1249 Dec 66.

Descriptors: (*Weightlessness, Blood pressure), (*Heart, Barometric pressure), Hypotension, Responses, Space flight, Exposure, Blood circulation, Blood plasma, Measurement.
Identifiers: Heart rate.

Orthostatic tachycardia and hypotension are known consequences of bed rest in normal subjects. This response is felt to follow from the reduction in plasma volume accompanying the salt and water diuresis of recumbency. Similar effects are felt to result from zero gravity during manned space flight. Lower body negative pressure (LBNP) has been suggested as a countermeasure to such adverse effects of weightlessness. Tilt table test responses were measured in six subjects after exposure to two conditions of LBNP. Six hours of intermittent (one minute on, one minute off) LBNP (55 mm. Hg) prevents the orthostatic tachycardia of six hours of bed rest. A continuous ninety minute LBNP (30 mm. Hg) exposure improves the tilt response to better than control values. These data support the proposal that LBNP may be useful in maintaining the orthostatic tolerance of confined and weightless astronauts. (Author)
AD-698 010

INFLUENCE OF AMBIENT TEMPERATURE ON EXCRETION OF CATECHOLAMINES AND METABOLITES,
Toronto Univ (Ontario) Dept of Pharmacology
A. Shum, G. E. Johnson, and K. V. Flattery. 1 May 68, 7p
Availability: Pub. in American Jnl. of Physiology, v216 n5 p1164-1169 May 69. No copies furnished.

Descriptors: (*Hormones, Stress (Physiology)), (*Excretion, Temperature), Epinephrine, Levarterenol, Secretion, Heat, Freezing, Exposure, Rats, Urine, Chemical analysis, Amines, Canada.
Identifiers: Catecholamines.

The study demonstrates the influence of ambient temperature on the excretion of epinephrine, norepinephrine, and their major metabolites. As a result of this work it is concluded that norepinephrine secretion increases in a cold environment and decreases during moderate warm exposure. Heat stress, 36 C, however, increases norepinephrine excretion. The rate of norepinephrine synthesis is inversely proportional to the ambient temperature and in three instances in our experiments the quantity of amine formed was not related to the amount secreted. It is thus concluded that the rate of norepinephrine synthesis is dependent, at least partially, on the ambient temperature and can dissociate itself from the rate of norepinephrine secretion. (Author)
AD-698 011

RELATIVE EFFECTIVENESS OF SELECTED SPACE FLIGHT DECONDITIONING COUNTERMEASURES,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 6E.
AD-698 048

EFFECTS OF FREQUENCY OF VIBRATION ON HUMAN PERFORMANCE,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Charles S. Harris, and Richard W. Shoenberger.
1966, 17p Rept no. AMRL-TR-66-152
Availability: Pub. in Jnl. of Engineering Psychology, v5 n1 p1-15 1966.

Descriptors: (*Tolerances (Physiology), *Vibration), Performance (Human), Gravity, Resonance, Stress (Physiology), Tracking.

The effect on human performance of whole body vibration at frequencies of 5.7, and 11 cycles per second was investigated. The minimum G level necessary to produce a significant decrement in tracking performance was determined at each frequency. The results showed that performance decrements tend to follow the general shape of physiological tolerance curves. (Author)
AD-698 068

IN VIVO BUBBLE DETECTION BY ACOUSTIC-OPTICAL IMAGING TECHNIQUES,
Naval Medical Research Inst Bethesda Md
For primary bibliographic entry see Field 6L.
AD-698 088

EFFECTS OF VIBRATION ON NAVY AND MARINE CORPS HELICOPTER FLIGHT CREWS.
Matrix Research Co Alexandria Va
For primary bibliographic entry see Field 5E.
AD-698 194 HC$3.00 MF$0.65

CINERADIOGRAPHIC ANALYSIS OF HUMAN VISCERAL RESPONSES TO SHORT DURATION IMPACT,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Edmund B. Weis, Jr., and George C. Mohr. 1967, 5p Rept no. AMRL-TR-67-39
Availability: Pub. in Aerospace Medicine, v38 n10 p1041-1044 Oct 67.

Descriptors: (*Acceleration tolerance, Responses), X rays, Stress (Physiology), Radiography, Motion pictures.
Identifiers: Cineradiographic analysis, Visceral responses.

A series of experiments are reported in which human volunteers are exposed to impacts of less than 10 milliseconds duration and velocity change of up to 2.44 meters/second. Cineradiographic analysis (60 frames/second) of the resulting motion is reported. The implications of the results of this analysis and correlations in animal experiments are discussed. (Author)
AD-698 209

COMPARISON OF STRAINS OF RATS EXPOSED TO OXYGEN AT VARIOUS PRESSURES,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Farrel R. Robinson, David T. Harper, Jr., and Harold F. Kaplan. 1967, 11p Rept no. AMRL-TR-66-62
Presented at the Annual Meeting, Animal Care Panel (16th), Philadelphia, Pa., 17 Nov 65.
Availability: Pub. in Laboratory Animal Care, v17 n5 p433-441 Oct 67.

Descriptors: (*Pressure breathing, *Rats), Oxygen, Poisoning, Pathology, Lungs, Exposure, Responses, Barometric pressure, Toxic tolerances.

The response of two strains of rats to 258, 700, and 760 mm Hg atmospheres containing 96-98% oxygen were compared. The Wistar strain was more sensitive to these atmospheres than the SPF Sprague-Dawley strain. Pulmonary lesions seen in Wistar rats exposed to 258 and 700 mm Hg were not characteristic of those reported for acute oxygen toxicity and may represent a pathologic response to a combination of reduced pressure and 96-98% oxygen atmosphere. (Author)
AD-698 215

EVALUATION OF ANIMALS CONTINUOUSLY EXPOSED TO A 5 PSIA PURE OXYGEN SPACE CABIN ATMOSPHERE FOR EIGHT MONTHS,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Harold P. Kaplan, Anthony A. Thomas, Kenneth C. Back, and Farrel R. Robinson. 1968, 6p Rept no. AMRL-TR-67-24
Availability: Pub. in Aerospace Medicine, v39 n1 p63-67 Jan 68.

Descriptors: (*Pressure breathing, *Laboratory animals), Oxygen, Toxicity, Barometric pressure, Exposure, Blood chemistry, Lungs, Pathology, Histology, Rats, Monkeys, Dogs, Mice.

One hundred seventeen animals of 4 species were continuously exposed to a pure oxygen atmosphere at 5 psia total pressure for 235 days. Clinical observation, serial blood chemistries, biochemical determination of hepatic cellular respiration, and histopathologic examinations revealed no evidence of systemic oxygen toxicity. Light microscopy revealed changes in the lungs of dogs and electron microscopy revealed changes in the lungs of dogs and rats that could be related to the oxygen exposure. It is unclear whether these changes were the result of the prolonged exposure or of the sudden return to ambient air prior to sacrifice. They were not associated with any apparent pulmonary functional deficit. (Author)
AD-698 221

THERMOREGULATORY RESPONSES IN DISPARATE THERMAL ENVIRONMENTS,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
J. F. Hall, and F. K. Klemm. 2 May 67, 7p Rept no. AMRL-TR-67-81
Availability: Pub. in Jnl. of Applied Physiology, v23 n4 p540-544 Oct 67.

Descriptors: (*Heat tolerance, Responses), (*Body temperature, Responses), Stress (Physiology), Heat, Perception, Body temperature, Perspiration, Space environmental conditions, Physiology.

Thermoregulatory responses to disparate thermal environments were investigated. Twenty-seven experiments were conducted on six subjects wearing light clothing and exposed supine, then prone, on a net support placed so that the subject's body midline was parallel and within a horizontal plane dividing upper and lower chamber sections. Upper chamber half was maintained at 82.2 and 93.3 C while lower half was at -6.7 C. Air temperatures varied from -6.7 to 82 and 93 C, with a range of 15-30 C at the subject. Following measurements at comfort conditions, 17 skin and rectal temperature, heart rate, and evaporation were measured and recorded every 5 min during the 30-min supine and 50-min prone exposure. While maximum differences between anterior-posterior mean skin temperature (Ts) of 9.1 and 9.5 C for the 82 and 93 C upper chamber temperatures, respectively, were measured, subjects reported thermal comfort. Maximum (Ts) variation at comfort was 4.1 C. Mean evaporative rates of 48.4 and 108.6 g/sq m hr for the 82 and 93 C exposures, respectively, indicated light sweating. Heart rate changes were insignificant. (Author)
AD-698 223

ACUTE HEAT STRESS WITHOUT BURNS AND HUMAN RED BLOOD CELLS,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Neil Abramson. 1968, 5p Rept no. AMRL-TR-67-84
Availability: Pub. in Aerospace Medicine, v39 n4 p413-416 Apr 68.

Descriptors: (*Heat tolerance, *Erythrocytes), Hematology, Hemolysis, Stress (Physiology).

The in vivo effect of short duration heat stress upon human red cells was studied. Eight subjects were exposed to tolerance (30-60 minutes at 71C, 4-6 mm.Hg vapor pressure. Venous blood, prior to and after heat exposure, was measured for hematocrit, hemoglobin, red cell count, red cell indices, morphology, osmotic fragility and mechanical fragility. Hemoglobin, hematocrit and red cell counts were significantly elevated ($p < 0.05$) after the heat exposure without changes in indices or morphology. An increase in post heat stress osmotic fragility was noted ($p < 0.05$) when compared to pre stress bloods. Mechanical fragilities were unchanged as a function of heat stress. After 24 hour incubation of pre and post stress blood (anticoagulated with oxalate), post heat stress specimens were significantly less osmotically fragile ($p < 0.05$) than pre stress specimens; however, these results could not be confirmed on heparinized or defibrinated bloods. Acute heat stress without cutaneous burns causes alterations in blood counts which are consistent with dehydration. The increases in post heat stress osmotic fragility were not accompanied by morphologic alterations. In this respect, 'burn hemolysis' differs from in vivo thermal effects. (Author)
AD-698 224

MEDICAL INDOCTRINATION FOR FLYERS. AN AEROMEDICAL HANDBOOK FOR AIRCREWS.
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 6E.
N64-19922 HC$3.00 MF$0.65

THE ORBITAL RESEARCH CENTRIFUGE - CONTINUED DESIGN AND FEASIBILITY STUDY FINAL REPORT.
General Dynamics/Convair, San Diego, Calif.
8 Jul 69, 192p NASA-CR-66830, GDC-DCL-69-002
Contract NAS1-8751

Descriptors: *Human centrifuges, *Human factors laboratories, *Orbital workshops, Experimental design, Human performance, Physiological responses, Weightlessness.

For abstract, see STAR 07 24.
N69-40074 HC$3.00 MF$0.65

CHANGES IN SUBJECTIVE ESTIMATES OF WELL-BEING DURING THE ONSET AND REMISSION OF MOTION SICKNESS SYMPTOMATOLOGY IN THE SLOW ROTATION ROOM.
Naval Aerospace Medical Inst., Pensacola, Fla.
A. Graybiel, and J. T. Reason. 19 Jul 69, 19p
NASA-CR-106280, NAMI-1083
NASA ORDER R-93

Descriptors: *Acceleration stresses (physiology), *Coriolis effect, *Human beings, *Motion sickness, Human tolerances, Ratings, Rotation.

For abstract, see STAR 07 24.
N69-41169 HC$3.00 MF$0.65

MAGNITUDE ESTIMATIONS OF CORIOLIS SENSATIONS.
Naval Aerospace Medical Inst., Pensacola, Fla.
A. Graybiel, and J. T. Reason. 18 Jul 69, 16p
NASA-CR-106389, NAMI-1082
NASA ORDER R-93

Descriptors: *Acceleration stresses (physiology), *Acceleration tolerance, *Coriolis effect, *Estimating, *Human tolerances, Head movement, Motion sickness, Performance prediction, Physiological effects, Psychophysiology, Rotating environments.

For abstract, see STAR 07 24.
N69-41174 HC$3.00 MF$0.65

PROGRESSIVE ADAPTATION TO CORIOLIS ACCELERATIONS ASSOCIATED WITH 1-RPM INCREMENTS IN THE VELOCITY OF THE SLOW ROTATION ROOM.
Naval Aerospace Medical Inst., Pensacola, Fla.
A. Graybiel, and J. T. Reason. 17 Jul 69, 19p
NASA-CR-106388, NAMI-1081
NASA ORDER R-93

Descriptors: *Acceleration stresses (physiology), *Adaptation, *Coriolis effect, *Human tolerances, *Rotating environments, Acceleration tolerance, Head movement, Motion sickness.

For abstract, see STAR 07 24.
N69-41175 HC$3.00 MF$0.65

RESPONSE OF UPPER-BODY X-IRRADIATED BEAGLE DOGS TO EXERCISE STRESS.
Rochester Univ., N.Y. Dept. of Radiation Biology and Biophysics.
For primary bibliographic entry see Field 6R.
For abstract, see NSA 23 23.
UR-49-1137 HC$3.00 MF$0.65

6T. Toxicology

PROLIFERATIVE PULMONARY LESIONS IN MONKEYS EXPOSED TO HIGH CONCENTRATIONS OF OXYGEN,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Farrel R. Robinson, David T. Harper, Jr., Anthony A. Thomas, and Harold P. Kaplan. May 67, 10p Rept no. AMRL-TR-66-36
Availability: Pub. in Aerospace Medicine, v38 n5 p481-486 May 67.

Descriptors: (*Oxygen, *Toxicity), Monkeys, Poisoning, Concentration (Chemistry), Lungs, Dosage, Exposure, Histology, Pathology, Responses, Body weight, Toxic tolerances.

Forty monkeys (Macaca mulatta) were exposed to 99-100 per cent oxygen at pressures from 600 to 760 mm. Hg. The acute exudative pulmonary response was seen in only three exposed at 760 mm Hg. The subacute proliferative pulmonary response was seen at all levels studied, the degree being directly related to time-dose exposures. In the high dose ranges clinical signs of illness were evident after 5-7 days exposure when the monkeys became listless and anoretic. By 14 days they were quite lethargic and had assumed a huddled position. Grossly, the heavy lungs had a gray, bloodless appearance. Microscopically, there was extreme proliferation of the interstitium and alveolar epithelium. None of the monkeys died that were exposed at 600 mm. Hg., although mild focal proliferative changes were seen. After 31 days postexposure, these changes appeared as focal areas of atelectasis with mild septal fibrosis. (Author)
AD-698 009

IMMUNOCHEMICAL STUDIES ON COBROTOXIN,
Kaohsiung Medical Coll (Taiwan) Dept of Biochemistry
For primary bibliographic entry see Field 6O.
AD-698 064

PICOLINALDEHYDE, 5 - HYDROXY - THIOSEMICARBAZONE, (NSC-107 392): DETERMINATION OF TOXICITY IN DOGS.
Mason Research Inst., Worcester, Mass.
For primary bibliographic entry see Field 6O.
PB-188 006 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF HYDROCHLORIC ACID.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 067 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF HYDROGEN SULFIDE.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 068 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ETHYLENE.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 069 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF NICKEL AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 070 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ARSENIC AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 071 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ZINC AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 072 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF PHOSPHORUS AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 073 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF MERCURY AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 074 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF CHROMIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 075 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF SELENIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 077 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF BERYLLIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 078 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF MANGANESE AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 079 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ASBESTOS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 080 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ALDEHYDES.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 081 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF AMMONIA.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 082 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF BARIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 083 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF BORON AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 085 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF CADMIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 086 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF CHLORINE GAS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 087 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF IRON AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 088 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ODOROUS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 089 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ORGANIC CARCINOGENS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 090 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF PESTICIDES.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 091 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF RADIOACTIVE SUBSTANCES.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 092 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF VANADIUM AND ITS COMPOUNDS.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 093 HC$3.00 MF$0.65

7. CHEMISTRY

7A. Chemical Engineering

FOAM SEPARATION AS A TOOL IN CHEMICAL OCEANOGRAPHY.
Naval Research Lab Washington D C
For primary bibliographic entry see Field 8J.
AD-697 924 HC$3.00 MF$0.65

ION EXCHANGE: A GENERIC NUCLEAR INDUSTRY PROCESS FOR THE RECOVERY AND FINAL PURIFICATION OF Am, Cm, Pm, Sr, Pu, Np, Cs, Tc, Rh, and Pd,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
BNWL-SA-1945 HC$3.00 MF$0.65

IODINE AND NOBLE GAS RETENTION STUDIES.
Du Pont de Nemours (E. I.) and Co., Aiken, S.C. Savannah River Lab.
For primary bibliographic entry see Field 18F.
For abstract, see NSA 23 23.
DP-1209 HC$3.00 MF$0.65

CATION EXCHANGE METHOD FOR PREPARING 238PuO2 MICROPARTICLES,
Mound Lab., Miamisburg, Ohio

For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
MLM-1569 HC$3.00 MF$0.65

CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE): PROGRESS REPORT FOR APRIL 1 TO JUNE 30, 1969,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 8I.
For abstract, see NSA 23 23.
ORNL-TM-2689 HC$3.00 MF$0.65

PRIMI RISULTATI SULLIMPIEGO DI TRACCIANTI NELLA DETERMINAZIONE DI ALCUNE CARATTERISTICHE DI FUNZIONAMENTO DI UNITA PER IL TRATTAMENTO INTENSIVO DELLE ACQUE (Preliminary Experiments on the Application of Tracers for the Determination of Some Operational Characteristics of Solids-Contact Units for Water Treatment),
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
For primary bibliographic entry see Field 13H.
PB-188 131 HC$3.00 MF$0.65

REGENERATION OF ACID WASTES FROM WATER DESALTING EQUIPMENT BY AN ELECTROCHEMICAL METHOD (K Voprosu o Regeneratsii Kislotnykh Stokov Vodoobessolivayushchikh Ustanovok Elektrokhimicheskim Metodom),
Argonne National Lab., Ill.
N. I. Isaev, and M. N. Romanov. Nov 69, 10p ANL-Trans-788
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Khimiya i Khimicheskaya Tekhnologiya (USSR) v12 n7 p924-928 1969, by Charles E. Stevenson.

Descriptors: (*Wastes (Industrial), *Electrochemistry), (*Desalination, Wastes (Industrial)), Acids, Ion exchange, Hydrochloric acid, Calcium compounds, Chemical engineering, USSR.

Regeneration of acid wastes from water desalting equipment is carried out because of their subsequent use for regeneration of cation separators. Achieving this in practice permits a reduction in the consumption of concentrated acid entering into the preparation of regenerating solution, and also decreases the use of reagents for waste neutralization. To solve this problem, and electrochemical method is often applied. The relative effectiveness of 3 schemes for electrochemical process conversion of the industrial wastes was studied. It was shown that conditions for conducting the process for the regeneration of wastes, by which the formation of Ca (OH)2 precipitates are excluded, may be controlled by varying the pH of the working solution. (Author)
PB-188 132T HC$3.00 MF$0.65

THE KINETICS OF ADSORPTION OF METHANE AND NITROGEN FROM HYDROGEN GAS. (B-2),
National Bureau of Standards, Boulder, Colo. Inst. for Basic Standards.
For primary bibliographic entry see Field 7D.
PB-188 220 HC$3.00 MF$0.65

STUDIES OF THE MEASUREMENT OF SULFUR DIOXIDE IN STACK GASES. THREE CONCURRENT STUDIES.
Industrial Nucleonics Corp., Columbus, Ohio.
For primary bibliographic entry see Field 13B.
For abstract, see NSA 23 23.
TID-25137 HC$3.00 MF$0.65

THE NUCLEAR EXPLOSIVE, A POTENTIAL ASSET TO CHEMICAL INDUSTRY (L'Explosif Nucleaire Atout Potentiel pour l'Industrie Chimique),
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 18C.
For abstract, see NSA 23 23.
UCRL-Trans-10372 HC$3.00 MF$0.65

7B. Inorganic Chemistry

IONIC FLUORINE CHEMISTRY.
Semiannual status rept. no. 5 (Final), 1 May-31 Aug 69,
Olin Corp New Haven Conn Chemicals Group
Gene A. Hyde, and Samuel I. Trotz. 31 Oct 69, 34p
Contract N00014-67-C-0435

Descriptors: (*Fluorides, Synthesis (Chemistry)), (*Iodine compounds, *Complex compounds), (*Antimony compounds, Complex compounds), Cesium compounds, Salts, Spectra (Infrared), X-ray diffraction analysis, Oxides.
Identifiers: *Iodine fluorides, Addition compounds, Cesium hexafluoroiodate, Iodate/hexafluoro, Iodine pentafluoride, Cesium iodate, Iodine oxides, *Antimony fluorides.

The report describes attempts to prepare iodine-fluorine interhalogen salts wherein both ions contain iodine and fluorine, or iodine, fluorine, and/or oxygen. Three starting materials were successfully prepared, CsIF6, IF4SbF6, and IF6SbF6, whose metathetical interactions would have given desired interhalogen salts. Failure to find suitable solvents for the intended reactions was primarily responsible for a lack of success in this area. In the course of preparing CsIF6 a previously unreported adduct was isolated, CsIF6.2IF5, and infrared and X-ray characteristics are given. One other positive aspect of the investigations is the partial clarification of the reactions of I2O5 with IF5 and IF7 as regards the synthesis of IO2F and 'IOF3'. (Author)
AD-697 970 HC$3.00 MF$0.65

THE INFRARED SPECTRA OF INORGANIC COMPOUNDS IN THE 500-33/cm REGION.
Technical rept. Sep 68-Mar 69,
Monsanto Research Corp Dayton Ohio Dayton Lab
William R. Feairheller, Jr., and John T. Miller, Jr. Oct 69, 60p* AFML-TR-69-233
Contract F33615-67-C-1363

Descriptors: (*Inorganic compounds, *Spectra (Infrared)), Reviews, Vibration, Molecular energy levels, Hydrates, Sulfates, Nitrates, Nitrites, Carbonates, Bicarbonates, Permanganates, Phosphates, Chromates, Chlorates, Perchlorates, Thiocyanates, Transition elements, Rare earth compounds.
Identifiers: *Far infrared spectroscopy, Vibrational energy levels, Titanium dioxide.

A literature review has been conducted on the infrared spectra of simple inorganic compounds in the 500-33/cm region, including most of the information available through mid-1968. This review has been limited to the simple anion and metal-anion vibrations and does not include the metal complexes. Some experimental work has been included to provide examples of some of the effects. The observed vibrations of the various inorganic compounds in the 500-33/cm region are tabulated. (Author)
AD-697 992 HC$3.00 MF$0.65

THE EFFECT OF WATER VAPOR ON THE LIOH-CO2 REACTION. PART I. DYNAMIC ISOTHERMAL SYSTEM,
Naval Research Lab Washington D C
D. D. Williams, and R. R. Miller. 29 Oct 69, 18p*
Rept no. NRL-6937

Descriptors: (*Carbon dioxide, *Absorption (Physical)), (*Controlled atmospheres, Carbon dioxide), Water, Chemical reactions, Hydroxides, Lithium compounds, Carbonates, Hydrates, Humidity, Life support.
Identifiers: *Lithium hydroxide, Lithium carbonates.

The role of water vapor (H2O) in the reaction of carbon dioxide (CO2) with lithium hydroxide (LiOH) in a dynamic system was isolated by maintaining an essentially isothermal system through the use of low concentrations of CO2. The LiOH was found to be hygroscopic, with the rate of water pickup directly related to the relative humidity of the feed system. Hydration to the monohydrate (LiOH-H2O) proved to be a necessary precursor to the CO2 reaction but the rate of hydration must not exceed the rate of carbonation if high efficiencies are to be realized. The controlled rate of hydration is necessary in order to maintain the high surface area and porosity of pelletized LiOH. The previously accepted equation, 2 LiOH+ CO2 yielding Li2CO3+ H2), thus becomes the summation of the two-step reaction, 2 LiOH+ 2 H2O= 2 LiOH.H2O and 2 LiOH.H2O+ CO2 yielding Li2CO3+ 3H2O. (Author)
AD-698 118 HC$3.00 MF$0.65

THE CHEMISTRY OF THE BIS (pi- (3)-1,2-DICARBOLLYL) METALLATES OF NICKEL AND PALLADIUM.
California Univ Riverside Dept of Chemistry
For primary bibliographic entry see Field 7C.
AD-698 136 HC$3.00 MF$0.65

OXIDATION OF AMMONIA CATALYZED BY MIXED OXIDES OF COPPER AND CHROMIUM.
Interim rept.,
Stanford Research Inst Menlo Park Calif
S. H. Inami, and H. Wise. 15 Nov 69, 13p
Contract Nonr-3415 (00)

Descriptors: (*Ammonia, *Oxidation), (*Copper compounds, *Catalysts), (*Ammonium perchlorate, *Solid rocket oxidizers), Chromates.
Identifiers: Copper oxide, Copper chromates.

The oxidation of ammonia catalyzed by cupric chromite (CuCr2O4) and cuprous chromite (Cu2O . Cr2O3) has been studied in order to examine the role of the copper ion valence state. The results at 400C indicate that Cu (2+) is a much better catalyst for this reaction in which nitrogen is the major product. Similar considerations apply to the complete oxidation of olefinic hydrocarbons. It is suggested that cupric chromite, commonly employed as an ignition and burning-rate catalyst for ammonium perchlorate solid propellants, plays the dual function of catalyzing the decomposition of ammonium perchlorate and the oxidation of ammonia and fuel molecules. (Author)
AD-698 152 HC$3.00 MF$0.65

25 YEARS OF RARE EARTHS. A BIBLIOGRAPHY OF RARE-EARTH RESEARCH PAPERS AND REPORTS PUBLISHED BY THE AMES LABORATORY FROM ITS FOUNDING TO ITS 25TH ANNIVERSARY,
Ames Lab., Iowa.
Joan E. Smith, Charla C. Bertrand, and Karl Gschneidner, Jr. Aug 68, 241p*

Descriptors: (*Rare earths, *Bibliographies).

For abstract, see NSA 23 23.
IS-RIC-2 HC$3.00 MF$0.65

VOLUMETRIC ESTIMATION OF ASCORBIC ACID WITH TETRAVALENT MANGANESE,
Mound Lab., Miamisburg, Ohio.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 23 23.
MLM-1689 HC$3.00 MF$0.65

HIGH TEMPERATURE PROPERTIES AND DECOMPOSITION OF INORGANIC SALTS. PART 2. CARBONATES,
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
K. H. Stern, and E. L. Weise. Nov 69, 38p*
See also Part 1, NBS-NSRDS-7. Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.45.

Descriptors: (*Carbonates, Bibliographies), (*Decomposition, Carbonates), Salts, Free energy, Pyrolysis, Chemical equilibrium, Reaction kinetics, Thermodynamics, Alkali metal compounds, Alkaline earth compounds, Rare earth compounds, Cobalt compounds, Copper compounds, Iron compounds, Lead compounds, Manganese compounds, Silver compounds, Thallium compounds, Zinc compounds.

The literature dealing with the high-temperature behavior of inorganic carbonates was critically reviewed. Free energy functions, of reactants and products of the decomposition reactions were calculated and tabulated from 298K up to as high a temperature as possible. Free energy functions and equilibrium constants of reactions were tabulated. Auxiliary data on phase transition, densities, and kinetics of thermal decomposition were included. The literature of the endothermic decomposition kinetics of solids, as it applies to carbonates, was reviewed. (Author)
NSRDS-NBS-30 HC$0.45 MF$0.65

X-RAY FINE STRUCTURE STUDIES OF THE OXIDATION OF FERROSOFERRIC OXIDE TO GAMMA-FERRIC OXIDE AND ALPHA-FERRIC OXIDE, AND THE REDUCTION OF ALPHA-FERRIC OXIDE TO FERROSOFERRIC OXIDE, FERROUS OXIDE, AND IRON.
Technische Hochschule Munchen (West Germany).
For primary bibliographic entry see Field 8G.
For abstract, see STAR 07 24.
N69-40904 HC$3.00 MF$0.65

STRUCTURE OF THE TRANSITION QUINTUPLET D (o) TO SEPTET F (2) IN EUROPIUM BENZOYLACETONATE IN SOLUTION (Structure de la Transition quintuplet D (o) to septet F (2) dans le Benzoylacetonate d'Europium en Solution),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 7D.
PB-188 096T HC$3.00 MF$0.65

PROGRESS REPORT FOR THE PROJECT (10TH) 'RESEARCH ON THE CHEMICAL PROPERTIES OF METAL CHELATES',
California Univ., Riverside. Dept. of Chemistry.
Donald T. Sawyer. 1 Jun 68, 15p UCR-34P45-22
Contract AT (11-1)-34

Descriptors: (*Complex compounds, *Nuclear magnetic resonance), (*Gas chromatography, Complex compounds), Molecular structure, Cobalt compounds, Rhodium compounds, Palladium compounds, Chelate compounds.

The report summarizes research devoted to investigations using proton nuclear magnetic resonance spectroscopy for the elucidation of the bonding and structures of various metal chelates. The NTA, MIDA, and IDA complexes of cobalt (III), palladium (III), and rohium (III) have been studied in detail. In addition the n.m.r. data permit a number of conclusions to be made concerning the structures of the various chelate species.
PB-188 098 HC$3.00 MF$0.65

CONTRIBUTION TO THERMOANALYTICAL STUDY OF THE DECOMPOSITION AND REDUCTION OF SULFATES (I),
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 7D.
PB-188 099T HC$3.00 MF$0.65

TRANSITION METAL COMPLEXES WITH METAL-METAL BONDS.
Annual progress rept.,
Georgia Univ., Athens. Dept. of Chemistry.
R. B. King, K. H. Pannell, and C. R. Bennett. Apr 68, 8p
Grant NSF-GP-7081

Descriptors: (*Transition elements, *Complex compounds), (*Metal carbonyls, *Phosphorus compounds), Silanes, Iron compounds, Tin compounds, Cyclopentenes, Molybdenum compounds.
Identifiers: Metal metal bonds, Cyclopentadiene compounds.

The report summarizes a program of research on transition metal complexes with metal-metal bonds. Brief summaries are given under the following headings: Photochemical reactions of silicon and tin derivatives of cyclopentadienyliron dicarbonyl with trivalent phosphorus ligands; Some triphenylphosphite derivatives of cyclopentadienylmolybdenum carbonyls; Polysilanyl derivatives of the metal carbonyls; The nature of the product formed from Mo (CO)6 and 8, 9-dihydroindene.
PB-188 189 HC$3.00 MF$0.65

PREPARATION OF HIGH-PURITY BORON NITRIDE POWDER,
Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
C. R. Schmitt, and R. K. Edwards. 6 Oct 69, 56p*
Contract W-7405-eng-26

Descriptors: (*Nitrides, Synthesis (Chemistry)), Boron compounds, Ammonia, Electron microscopy.
Identifiers: *Boron nitrides, Boron oxides, Calcium phosphates.

For abstract, see NSA 23 23.
Y-1688 HC$3.00 MF$0.65

7C. Organic Chemistry

RAPID STRUCTURE SEARCHES VIA PERMUTED CHEMICAL LINE-NOTATIONS (III): A COMPUTER-PRODUCED INDEX.
Chemical Research and Development Labs. Edgewood Arsenal, Md.
For primary bibliographic entry see Field 5B.
AD-460 826 HC$3.00

THE PREPARATION AND PROPERTIES OF ORGANIC DERIVATIVES OF PEROXIDES OF PHOSPHORUS, TIN, BORON, SILICON, AND SULFUR.
Final rept.,
Western Reserve Univ., Cleveland, Ohio.
Ralph L. Dannley. Aug 65, 5p AROD-3342:9
Grant DA-ARO (D)-31-124-G242
Distribution Limitation now Removed.

Descriptors: (*Tin compounds, *Hydroperoxides), (*Silanes, Peroxides), (*Organic phosphorus compounds, Peroxides), (*Organic sulfur compounds, *Peroxides), Synthesis (Chemistry), Reaction kinetics, Metalorganic compounds, Photolysis, Polymers, Decomposition.
Identifiers: Tin organic compounds.

Hydroperoxides of SN, hydroperoxides of SI, bisperoxides of SI, a bisperoxide of P, and stable sulfonyl peroxides were prepared. Hydroperoxides of the group IV elements other than C tend to rearrange rather than react with other compounds. Kinetics, products, and energies of activation were determined. With an increasing atomic wt. of the peroxidic elements there is a decrease in activation energy for the rearrangement process which is much smaller than predicted in the literature. All the hydroperoxides are reasonably stable. The bisperoxide of P is of reasonable stability but tends to rearrange. Of all the sulfonyl peroxides prepared, only the nitro derivatives were safe for routine use. They substitute aromatic nuclei in 70% yield and the sulfonate esters produced hydrolyze easily. Peroxidic compolymers of SN compounds, aldehydes and ketones are very stable and may be of value as free radical catalysts which decompose by mechanical shear. (Author)
AD-468 448 HC$3.00 MF$0.65

SYNTHESIS OF AROMATIC OR ALIPHATIC POLYSULFONE RUBBER.
Army Weapons Command Rock Island Ill Science and Technology Lab
For primary bibliographic entry see Field 11J.
AD-698 020 HC$3.00 MF$0.65

SYNTHESIS AND CHARACTERIZATION OF 2-ETHYL-3-HEXANOL para-HYDROXYBENZOATE,
Fort Detrick Frederick Md
For primary bibliographic entry see Field 6O.
AD-698 026 HC$3.00 MF$0.65

HIGH TEMPERATURE REACTIONS OF SUBSTITUTED PYRROLES.
Final rept. 1 Sep 65-30 Sep 69,
Kentucky Research Foundation Lexington
John M. Patterson. Sep 69, 10p AROD-5551:4-C
Grant DA-ARO (D)-31-124-G675

Descriptors: (*Pyrroles, *Molecular isomerism), Stereochemistry, Reaction kinetics, Pyrolysis.
Identifiers: *Rearrangement reactions, Chemical reaction mechanisms.

Research was undertaken to elucidate product formation and the reaction path followed in the thermally-induced isomerization of N-substituted pyrroles. Various parameters such as the effect of substituents (pyrrole-ring substituents and migrating-group substituents) on migration aptitudes, on product distribution and on reaction rate were investigated. The study of a reaction in which the potential migrating group is optically active was proposed in order to determine the nature of migration process. (Author)
AD-698 043 HC$3.00 MF$0.65

VOLATILE FLUORO- AND TRIFLUOROMETHYL DIPHOSPHORUS COMPOUNDS CONTAINING PHOSPHORUS IN TWO VALENCIES,
Alberta Univ Edmonton Dept of Chemistry
R. G. Cavell, T. L. Charlton, and A. A. Pinkerton. 18 Feb 69, 1p
Availability: Pub. in Chemical Communications p424-425 1969. No copies furnished.

Descriptors: (*Organic phosphorus compounds, Chemical reactions), Iodides, Synthesis (Chemistry), Sulfur compounds, Nuclear magnetic resonance, Fluorine compounds, Canada, Halogenated hydrocarbons.
Identifiers: *Phosphoranes, Phosphinothioic iodide/bis (trifluoromethyl), Phosphinodithioic acid/bis (trifluoromethyl)- (bis (trifluoromethyl)phosphino-ester).

Reported attempts to prepare quinquevalent diphosphorus compounds from bis (trifluoromethyl)iodophosphine sulphide, (CF3)2P (S)I and iodothiophosphoryl difluoride, SPF2I, were unsuccessful. It was found that the reaction of the above iodophosphorus compounds with stoicheiometric quantities of metallic mercury at room temperature gives the desired diphosphorus disulphide compounds 2X2P (S)I+ Hg yields X4P2S2+ HgI2 (X= F,CF3). The reactions are slow and require vigorous agitation to renew the reactive metal surface. (Author)
AD-698 074

SYNTHESIS OF DITERTIARY ACETYLENE GAMMA-GLYCOLS OF THE FERROCENE SERIES,
Foreign Technology Div Wright-Patterson AFB Ohio
I. M. Gverdtsiteli, and L. P. Asatyani. 8 Sep 69, 8p
Rept no. FTD-HT-23-425-69
Edited trans. of Akademiya Nauk Gruzinskoi SSR, Tiflis. Soobshcheniya, v51 n1 p91-94 1968, by D. Koolbeck.

Descriptors: (*Ferrocenes, Chemical reactions), (*Alkenes, Synthesis (Chemistry)), (*Grignard reactions, Ferrocenes), Grignard reagents, USSR, Alcohols.
Identifiers: Hexyne diol/ferrocenyl, Translations.

Synthesized were ditertiary acetylene glycols of the ferrocene series by the condensation of acetylferrocene with acetylenyl magnesium bromide of several carbinols (dimethylethynyl, methylethylethynyl, methyl-n-propylethynyl, cyclopentylethynyl, and cyclohexylethynyl). (Author)
AD-698 111 HC$3.00 MF$0.65

INVESTIGATION OF THE PROCESS OF DECOMPOSITION OF VARIOUS FRACTIONS OF LIGHT OIL AT HIGH TEMPERATURES,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11H.
AD-698 112 HC$3.00 MF$0.65

THE CHEMISTRY OF THE BIS (pi- (3)-1,2-DICARBOLLYL) METALLATES OF NICKEL AND PALLADIUM.
Technical rept.,
California Univ Riverside Dept of Chemistry
Leslie F. Warren, Jr., and M. Frederick Hawthorne. 10 Nov 69, 103p Rept no. TR-10
Contract N00014-67-A-0111-0021

Descriptors: (*Organoboranes, *Complex compounds), (*Molecular structure, Organoboranes), (*Nickel compounds, Organoboranes), (*Palladium compounds, Organoboranes), Synthesis (Chemistry), Chemical bonds, Molecular orbitals, X-ray diffraction analysis, Spectra (Infrared), Nuclear magnetic resonance, Molecular isomerism, Platinum compounds, Spectra (Visible+ ultraviolet).
Identifiers: Dicarba-3-nickela-dodecaborane (11)/commo-bis-1-2, Dicarba-3-palladadodecaborane (11)/commo-bis-1-2, *Carboranes, Electron acceptors, Pi complexes, Rearrangement reactions, Dicarba-3-platina-dodecaborane (11)/cyclopentadienyl-1-2.

The synthesis, reactions, and structures associated with the 'sandwich'-bonded bis (pi- (3)-1,2-dicarbollyl) complexes of nickel and palladium, (M (n+) (1,2-B9C2H11)2 (n-4) (M=Ni,Pd), and their carbon-substituted derivatives are discussed. The nickel and palladium bis (dicarbollyl) systems each contain species with the metal atoms in the formal+2 (d8, two unpaired electrons for nickel, diamagnetic for palladium),+3 (d7, one unpaired electron), and+4 (d6, diamagnetic) oxidation states. X-ray diffraction studies coupled with magnetic, spectral, and electrochemical data were obtained for structural information. The uncharged (pi- (3)-1,2-B9C2H11)2M (IV) derivatives are Lewis acids which form addition compounds with a variety of 'soft' Lewis bases, e.g., halide ions, thiocyanate ion, naphthalene, etc. The C, C'-dimethyl-substituted nickel and palladium systems, M (1,2-B9H9C2 (CH3)2)2, exhibit facile thermal ligand rearrangement reactions leading to three isomeric series of complexes. In these isomerization reactions, a ligand carbon atom in the icosahedral surface was found to migrate away from the metal atom while remaining adjacent to the carbon atom in the open pentagonal face of the ligand. Similar rearrangements occur in the unsubstituted Ni (1,2-B9C2H11)2 complex at 360-400C in the vapor phase. Cyclic voltammetry, optical resolution studies, kinetic and nmr data and their roles in the structure elucidation of these complexes are presented. (Author)
AD-698 136 HC$3.00 MF$0.65

ELECTROPHILIC SUBSTITUTION REACTIONS OF 1,6-C2B7H9
Technical rept.,
California Univ Los Angeles Dept of Chemistry
Gary B. Dunks, and M. Frederick Hawthorne. 20 Nov 69, 34p Rept no. TR-11
Contract N00014-67-A-0111-0021

Descriptors: (*Organoboranes, *Substitution reactions), (*Nuclear magnetic resonance, Organoboranes), Mass spectrum, Spectra (Infrared), Bromine compounds.
Identifiers: Dicarbanonaborane (9)/closo, *Carboranes.

Electrophilic substitution reactions of 1,6-dicarba-closo-nonaborane (9) were studied and found to occur preferentially at the boron atom in the 8 position. Methyl, ethyl, bromo and tetrabromo derivatives, were prepared and structurally characterized by H and 11B nmr spectroscopy. (Author)
AD-698 141 HC$3.00 MF$0.65

FORMATION AND STRUCTURE OF SUBSTITUTED CARBONYL HALOGENIDES OF OSMIUM AND RUTHENIUM.
Bildung Und Struktur Substituierter Carbonylhalogenide Von Osmium Und Ruthenium
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Allgemeine Wissenschaften.
P. John. 3 Jul 68, 102p
Lang- in German

Descriptors: *Carbonyl compounds, *Chemical bonds, *Halogen compounds, *Ligands, *Osmium compounds, *Ruthenium, Chalcogenides, Halogenation.

For abstract, see STAR 07 24.
N69-40530 HC$3.00 MF$0.65

CLUSTERING OF IONS IN ORGANIC POLYMERS - A THEORETICAL APPROACH.
Mcgill Univ., Montreal (Quebec). Dept. of Chemistry.
A. Eisenberg. 30 Jul 69, 37p AD-691456, TR-19
Contract N00014-68-C-0237
Subm- Submitted for Publication

Descriptors: *Clumps, *Dielectric properties, *Ions, *Organic compounds, *Polymers, High temperature, Molecular structure, Surface properties, Thermodynamics.

For abstract, see STAR 07 24.
N69-40810 HC$3.00 MF$0.65

FLASH-SPECTROSCOPIC STUDIES ON ACRIDINES AND ACRIDANES IN THE 300 DEG TO 90 DEG K TEMPERATURE RANGE.
Blitzlichtspektroskopische Untersuchungen An Acridinen Und Acridanen Im Temperaturbereich 300 Deg K Minus 90 Deg K
Technische Hochschule Munchen (West Germany). Fakultat Fuer Allgemeine Wissenschaften.
G. Prell. 1969, 123p
Lang- in German

Descriptors: *Acriflavine, *Photochemical reactions, *Photolysis, *Spectrum analysis, Absorption spectra, Dyes, Flash lamps, Molecular diffusion, Physical chemistry, Thermochemistry.

For abstract, see STAR 07 24.
N69-40838 HC$3.00 MF$0.65

ON THE MECHANISM OF CATALYTIC HYDRATION BASED ON INTRAMOLECULAR HYDROGEN ISOTOPE DISTRIBUTIONS AND EFFECTS.
Zum Mechanismus Der Katalytischen Hydrierung Aufgrund Von Intramolekularen Wasserstoff-Isotopenverteilungen Und- Isotopeneffekten
Technische Hochschule Munchen (West Germany). Fakultaet Fuer All Gemeine Wissenschaften.
O. Berngruber. 1969, 107p
Lang- in German

Descriptors: *Carbonyl compounds, *Hydration, *Hydrogen isotopes, *Intermolecular forces, *Tritium, Catalysis, Distribution (property), Isotope effect, Radiochemistry.

For abstract, see STAR 07 24.
N69-40877 HC$3.00 MF$0.65

RADIATION-INDUCED REACTIONS OF SOME FURAN CHEMICALS,
Oak Ridge National Lab., Tenn.
J. J. J. Myron, and W. W. Parkinson. Aug 69, 25p*
Contract W-7405-eng-26

Descriptors: (*Furans, *Radiation chemistry), (*Polymerization, Radiation chemistry), Sulfoxides, O-heterocyclic compounds, Dienes.
Identifiers: Furan/tetrahydro, *Methyl sulfoxide, *Radiolysis, *Furfurals, *Furfuryl alcohol/tetrahydro, *Pentadienes.

For abstract, see NSA 23 23.
ORNL-4373 HC$3.00 MF$0.65

STUDIES ON THE DEVELOPMENT OF MATERIALS FOR USE IN ARTIFICIAL HEART DEVICES.
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
For primary bibliographic entry see Field 6L.
PB-188 108 HC$3.00 MF$0.65

STUDIES ON THE DEVELOPMENT OF MATERIALS FOR USE IN ARTIFICIAL HEART DEVICES.
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
For primary bibliographic entry see Field 6L.
PB-188 111 HC$3.00 MF$0.65

TRANSITION METAL COMPLEXES WITH METAL-METAL BONDS.
Georgia Univ., Athens. Dept. of Chemistry.
For primary bibliographic entry see Field 7B.
PB-188 189 HC$3.00 MF$0.65

7D. Physical Chemistry

ON THE THEORY OF ABSORPTION OF INFRARED RAYS BY NONIDEAL ION CRYSTALS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20L.
AD-697 895 HC$3.00 MF$0.65

SURFACE INTERACTION BETWEEN MOLTEN OXIDES AND REFRACTORY METALS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11F.
AD-697 915 HC$3.00 MF$0.65

CAPTURE, LOSS AND IONIZATION CROSS SECTIONS OF IONS AND NEUTRAL PARTICLES.
Final rept.,
Pittsburgh Univ Pa
T. M. Donahue. Dec 69, 4p
Contract Nonr-624 (06)

Descriptors: (*Hydrogen, Scattering), Particle beams, Gas ionization.
Identifiers: *Collision cross sections, *Ion molecule interactions.

Experimental and theoretical work was devoted principally to measuring and calculating cross sections for charge changing and ionizing collisions of H (+), H, and H (-) with gas molecules. The scope of the accomplishments achieved during this period is indicated in a list of publications included in the report.
AD-697 963 HC$3.00 MF$0.65

CHEMICAL CONCENTRATIONS OF POLLUTANT LEAD AEROSOLS, TERRESTRIAL

DUSTS, AND SEA SALTS IN GREENLAND AND ANTARCTIC snow strata,
Scripps Institution of Oceanography La Jolla Calif
For primary bibliographic entry see Field 8L.
AD-697 964 HC$3.00 MF$0.65

PROGRESS REPORT, JUNE 15 - DECEMBER 15, 1969,
Wayne State Univ Detroit Mich Research Inst for Engineering Sciences
For primary bibliographic entry see Field 4A.
AD-697 967 HC$3.00 MF$0.65

OPTICAL AND ELECTRON SPIN RESONANCE STUDIES OF FOURTH NEAREST NEIGHBOR CHROMIUM ION PAIRS IN RUBY.
California Univ Santa Cruz Div of Natural Sciences
For primary bibliographic entry see Field 20L.
AD-697 982 HC$3.00 MF$0.65

THERMAL DEGRADATION OF POLYESTERS. PART II. AROMATIC AND SEMIAROMATIC POLYMERS.
Technical rept. 1 Jul 67-1 Jul 68,
Air Force Materials Lab Wright-Patterson AFB Ohio
I. J. Goldfarb, and R. McGuchan. Oct 69, 57p*
Rept no. AFML-TR-68-182-Pt-2
See also Part 1, AD-678 883.

Descriptors: (*Polyester plastics, Degradation), (*Thermogravimetric analysis, Polyester plastics), Pyrolysis, Thermal stability, Differential thermal analysis, Aromatic compounds, Spectra (Infrared), Mass spectrum, Free radicals.
Identifiers: *Polyethylene terephthalate, Poly (succinyl-phenylene), Poly (terephthaloyl-hexamethylene), Poly (sebacoyl-phenylene), Poly (terephthaloyl-phenylene), Poly (terephthaloyl-biphenylene), Poly (isophthaloyl-phenylene).

Poly (hexamethylene terephthalate) degrades by the mechanism observed for aliphatic polymers--random scission and subsequent reaction of the olefinic and acid end-groups. When the acid part is aliphatic as in poly (1,4-phenylene succinate) and poly (1,4-phenylene sebacate), the polymers are less stable initially than comparable aliphatic polyesters. The degradation mechanism is more complex and involves cross-linking; the cross-linked sebacate product breaks down by a second degradation reaction but the succinate forms a residue which does not undergo further breakdown. Fully aromatic systems studied, namely poly (1,4-phenylene terephthalate), poly (1,3-phenylene isophthalate), poly (1,4-phenylene isophthalate-co-terephthalate) and poly (4,4'-biphenylene isophthalate), were more thermally stable, especially the all para system, and 35 to 45% of the initial weight remained at 800C. Features such as initial low activation energy processes, complex rate curves with several components and char formation at high temperatures imposed difficulties in kinetic analysis of the degradations by programmed thermogravimetry. (Author)
AD-697 987 HC$3.00 MF$0.65

THE INFRARED SPECTRA OF INORGANIC COMPOUNDS IN THE 500-33/cm REGION.
Monsanto Research Corp Dayton Ohio Dayton Lab
For primary bibliographic entry see Field 7B.
AD-697 992 HC$3.00 MF$0.65

STUDY OF METAL FLUORINE COMPLEXES.
Technical rept. Jun 64-Jan 69,
Utah Univ Salt Lake City Dept of Chemistry
Ronald O. Ragsdale. Oct 69, 147p* AFML-TR-69-243
Contract AF 33 (615)-2565

Descriptors: (*Fluorides, *Complex compounds), (*Titanium compounds, Complex compounds), (*Nuclear magnetic resonance, Fluorides), Molecular isomerism, Pyridines, Spectra (Infrared).
Identifiers: *Titanium fluorides, Electron acceptors, Addition compounds, Chemical shifts (Nuclear magnetic resonance), Titanium/bis (pyridine-oxide)-tetrafluoro.

A self-consistent set of sigma constants was developed to obtain linear free energy relations with titanium tetrafluoride complexes of the aromatic amine oxides. Several series of the diadducts of titanium tetrafluoride were studied with high-resolution fluorine-19 nuclear magnetic resonance spectroscopy. These series consisted of fluorotitanate complexes of formula TiF4.2 (donor) and TiF5. (donor) (-), where donor represents an organic molecule (Lewis base) which coordinates through oxygen. The TiF4.2 (donor) adducts included both TiF4.2D complexes in which the donors are identical, and TiF4.D,D' complexes, in which D and D' represent different Lewis bases. Cis-trans isomerism of the diadducts of TiF4 was also studied. Some complexes of TiF4 with substituted pyridines were also investigated. Fluorine-19 chemical shifts and spin-spin coupling constants were determined for most of the fluorotitanate complexes. The temperature dependence of the TiF4.2D spectra was also studied. The low infrared spectra of some SnF4.2D and TiF4.2D were also obtained. (Author)
AD-697 993 HC$3.00 MF$0.65

PLASMA EFFECTS IN ANNULENE MOLECULES,
Boeing Scientific Research Labs Seattle Wash Plasma Physics Lab
David B. Chang, and James E. Drummond. Oct 69, 38p Rept no. D1-82-0915

Descriptors: (*Cycloalkenes, *Molecular orbitals), (*Plasma physics, Cycloalkenes), Molecular energy levels, Electron transitions, Cyclooctatetraene, Dienes, Wave functions.
Identifiers: *Cyclopolyene compounds, Cyclobutadiene compounds, Cyclodecapentaenes, Cyclooctadecanonaenes.

Some plasma effects of the pi-electrons in annulene molecules were studied. The dispersion relation for plasma oscillations, obtained by using Huckel molecular orbitals in the second quantization formalism, was found to describe sound-like waves. The resulting polarization response of the pi-electrons causes a spatial modulation of the interaction potential between two pi-electrons. Correlation is discussed by using the modified interaction potential with a Wannier hamiltonian in pair and quartet equations. The effect of bond alternation is considered in connection with the variation of induced currents in unsaturated annulenes with temperature. (Author)
AD-698 024 HC$3.00 MF$0.65

STARK-BROADENED HYDROGEN AS TEMPERATURE PROBES IN NITROGEN PLASMAS,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
D. E. Buttrey. 12 Nov 68, 7p
Sponsored in part by Air Force Weapons Lab., Kirtland AFB, N. Mex.
Availability: Pub. in The Jnl. of Chemical Physics, v51 n1 p122-128, 1 Jul 69.

Descriptors: (*Nitrogen, *Molecular orbitals), (*Shock tubes, Nitrogen), Stark effect, Gas ionization, Electron transitions, Plasma medium, Ions.
Identifiers: *Temperature measurement.

Trace quantities of hydrogen have been introduced into shock waves in nitrogen to determine the ion density behind the reflected shock by measuring the widths of time-resolved, Stark-broadened, Balmer lines. The temperatures inferred from the measured ion densities are compared with those obtained from the measured starting pressures and incident shock velocities. Agreement to 10% of the ion-density inferred temperatures with the calculated reflected-shock temperatures was found. Initial overshoots of as much as a factor of 2 were found in the spectral radiation signals for both the p= 1 mm N2 and the p= 0.5 mm N2 data. Representative photomultiplier-scope traces of radiation signals from the 3914-A (0,0) N2 (+) first negative system, the 5666-A multiplet of N II, and the nitrogen continua processes are discussed in conjunction with the ion-density histories. (Author)
AD-698 056

IONIZATION COEFFICIENTS AND SPARKING VOLTAGES IN ARGON-METHANE AND ARGON-PROPANE MIXTURES,
Leeds Univ (England) Dept of Electrical and Electronic Engineering
A. E. D. Heylen. 18 Mar 68, 11p AFCRL-69-0497
Contract F61052-68-C-0013
Availability: Pub. in Int. Jnl. Electronics, v24 n2 p165-175 1968.

Descriptors: (*Argon, *Ionization potentials), Methane, Propanes, Gas ionization, Mixtures, Quenching (Inhibition), Sparks, Great Britain.

Townsend primary and secondary ionization coefficients have been measured in 0.03, 0.3 and 3% of methane and of propane in argon for a total pressure in the range 0.5-500 torr and for a uniform field gap up to 1 cm. The primary ionization coefficient for the Ar-CH4 mixtures remains within 30% of that for pure argon but an optimum concentration of 0.13% of propane in the Ar-C3H8 mixture gives rise to a Penning effect almost comparable in intensity to that observed by Kruithof and Penning in Ne-Ar mixtures. (Author)
AD-698 071

Pi-BONDING IN THE BORON-OXYGEN BOND,
Alberta Univ Edmonton Dept of Chemistry
G. F. Lantheir, and W. A. G. Graham. 25 Apr 68, 2p DRB-Reprint-2949
Availability: Pub. in Chemical Communications p715 1968. No copies furnished.

Descriptors: (*Boranes, *Nuclear magnetic resonance), Oxides, Molecular orbitals.
Identifiers: Borane/oxy-bis (dimethyl-), Chemical shifts (Nuclear magnetic resonance).

Variable temperature n.m.r. studies dimethylboric anhydride showed that the single boron-methyl resonance at tau 9.57 exhibited by this compound broadened as the temperature was lowered and split into two separate resonances below -- 68C. The activation energy for this phenomenon, calculated according to Gutowsky and Holm, is 8.6 kcal. The spectrum of the carbon analogue, di-isopropyl ether, remained unaffected as low as -- 100C. (Author)
AD-698 072

INVESTIGATION OF THE HYPERFINE STRUCTURE OF THE 6 DOUBLET P (3/2) STATE OF 133Cs BY A LEVEL-CROSSING METHOD,
Windsor Univ (Ontario) Dept of Physics
P. Violino. 31 Mar 69, 8p
Contract N00014-67-C-0538, ARPA Order-125
Availability: Pub. in Canadian Jnl. of Physics, v47 n19 p2095-2099 1969.

Descriptors: (*Cesium, *Hyperfine structure), Atomic energy levels, Atomic spectroscopy, Canada.

The hyperfine structure of the 6 doublet P (3/2) state of 133Cs has been studied using the level-crossing method with an unconventional experimental arrangement. The value of the hyperfine structure constant A was found to be 50.45 MHz. (Author)
AD-698 075

NONEXISTENCE OF lsns AUTOIONIZING STATES OF H (-),
York Univ Toronto (Ontario) Centre for Research in Experimental Space Science
Anthony Wallis, D. L. S. McElwain, and H. O. Pritchard. 24 Jan 69, 3p DRB-Reprint-3146
Availability: Pub. in The Jnl. of Chemical Physics, v50 n10 p4543-4545, 15 May 69. No copies furnished.

Descriptors: (*Hydrogen, *Wave functions), Ions, Atomic orbitals, Gas ionization, Canada.

The convergence and coalescence properties of a two-electron wavefunction containing integral powers and exponential terms in r1, r2, and r12 have been investigated. Solutions were obtained for the singlet and triplet 1sns states for both integral and nonintegral values of the nuclear charge Z, and it was concluded that the 1sns manifold converges to a degenerate eigenvalue as Z approaches 1 for all n>2. (Author)
AD-698 076

EFFECT OF TEMPERATURE ON THE SPECTRUM OF SULFUR DIOXIDE,
Toronto Univ (Ontario) Dept of Chemistry
J. Brown, and George Burns. 26 Mar 69, 4p DRB-Reprint-3140
Grant AF-AFOSR-506-69
Availability: Pub. in Canadian Jnl. of Chemistry, v47 n22 1969.

Descriptors: (*Sulfur compounds, *Spectra (Visible+ ultraviolet)), Temperature, Dioxides, Molecular energy levels, Enthalpy, Canada.
Identifiers: *Sulfur dioxide.

The effect of temperature on the ultraviolet spectrum of sulfur dioxide has been studied over the temperature range 20 to 1000C. The equilibrium constant for the reaction SO2= (SO2), where (SO2) is an isomeric form or an excited state of sulfur dioxide, has been obtained at several temperatures. The enthalpy change for the transition was found to be 4.1 kcal/mole. (Author)
AD-698 089

THE SHAPES OF SMALL MOLECULES, AN OXFORD INORGANIC DISCUSSION SPONSORED BY THE CHEMICAL SOCIETY, SEPTEMBER 26, 1969.
Conference rept.,
Office of Naval Research London (England)
Charles P. Smyth. 31 Oct 69, 7p Rept no. ORNL-C-17-69

Descriptors: (*Inorganic compounds, *Chemical bonds), Symposia, Molecular orbitals, Geometry, Hydrides, Free radicals, Molecular energy levels, Great Britain.

A one-day discussion of the shapes of small molecules was devoted, partly to structural theory, partly, to electron spin resonance, but, in greatest part, to the methods and results of spectroscopy. Measured bond angles and lengths were reported in order to show the shapes and sizes of many small molecules and give information concerning the nature of the bonds. (Author)
AD-698 090 HC$3.00 MF$0.65

RAPID MICROANALYSIS OF BERYLLIUM IN BIOLOGICAL FLUIDS BY GAS CHROMATOGRAPHY,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
M. L. Taylor, E. L. Arnold, and R. E. Sievers. 12 Aug 68, 14p Rept no. AMRL-TR-68-96
Revision of report dated 22 Jul 68.
Availability: Pub. in Analytical Letters, v1 n12 p735-747 1968.

Descriptors: (*Beryllium compounds, *Gas chromatography), (*Complex compounds, Gas chromatography), Electron capture, Biochemistry.
Identifiers: *Pentane dione complexes, Pentane dione/trifluoro-2-4.

A simple method was developed by which volatile derivatives of a number of metallic cations may be formed and then separated and quantitated by gas chromatography. This method was applied to the extraction and quantitation of Be2+ in four different fluids of biological origin. The newly developed method involves the direct treatment of biological fluids containing beryllium with trifluoroacetylacetone (H (tfa)) in a sealed glass ampule and subsequent quantitative analysis of the reaction mixture by GLC using an electron capture detector. No preparative steps are needed on the samples, nor are concentration techniques necessary. Time requirements for a typical analysis are less than one hour. As little as 2.95 x 10 to the -7th g Be2+/50 microl sample was routinely quantitated. (Author)
AD-698 092

ELECTRON-ION AND ION-ION DISSOCIATIVE RECOMBINATION OF OXYGEN. II. ION-ION RECOMBINATION,
California Univ San Diego La Jolla Dept of Physics
F. T. Chan. 15 Mar 68, 7p AROD-5133:161-P
Contract DA-31-124-ARO (D)-257
Availability: Pub. in The Jnl. of Chemical Physics, v49 n6 p2540-2546, 15 Sep 68.

Descriptors: (*Oxygen, *Recombination reactions), (*Ionosphere, Oxygen), Ions, Interactions, Dissociation.
Identifiers: *Collision cross sections, Electron tunneling, Ion ion interactions.

The rate coefficient and the thermal cross section for the oxygen ion-ion dissociative recombination are calculated using the semiclassical formalism. The motion of the heavy particles (positive and negative ions) in their mutual Coulomb field is treated classically. At certain ranges of the ion-ion separation (determined from energy conservation), the electron tunnels from the negative ion to the positive ion. Using the experimental data on the electron binding energy of O2 (-), this tunneling effect is calculated in the WKB approximation. It is found that the linewidth of the levels due to the dissociative effect is important for the electron tunneling and the molecular dissociation. The rate coefficients and the thermal cross sections have been calculated between 200 and 500K. No direct laboratory data is available, but the theoretical results are in agreement with indirect observations from the ionosphere. (Author)
AD-698 099

THE EFFECT OF WATER VAPOR ON THE LiOH-CO2 REACTION. PART I. DYNAMIC ISOTHERMAL SYSTEM,
Naval Research Lab Washington D C
For primary bibliographic entry see Field 7B.
AD-698 118 HC$3.00 MF$0.65

DETERMINATION OF TRACE QUANTITIES OF HALOGENATED HYDROCARBONS IN GAS SAMPLES,
Naval Research Lab Washington D C
Federick W. Williams, Merle E. Umstead, and J. Enoch Johnson. 6 Nov 69, 18p* Rept no. NRL-6964

Descriptors: (*Halogenated hydrocarbons, *Air pollution), (*Gas chromatography, Halogenated hydrocarbons), (*Organic solvents, Air pollution), Controlled atmospheres, Chlorine compounds, Gas detectors, Bromine compounds, Iodine compounds, Ethylenes, Life support.
Identifiers: Chlorine aliphatic compounds.

Halogenated organic solvents are of particular concern in closed atmospheric situations such as nuclear submarines, spacecraft, and hyperbaric chambers due to their corrosive and toxic potential. A gas chromatographic on-column concentrating technique has been developed for the analysis of halocarbons in atmospheric gas mixtures, thus eliminating the use of cold traps. An important part of this analytical system is a coulometric detector which is specific for chlorinated, brominated, or iodated hydrocarbons. By making use of this specific detector and the on-column concentrating technique, gas samples can be analyzed quantitatively for chlorinated contaminant compounds at concentrations as low as 10 to 20 parts per billion by volume. (Author)
AD-698 120 HC$3.00 MF$0.65

AN INTERPRETATION OF BILOBATE INTENSITY STRUCTURE IN RARE GAS BEAMS SCATTERED FROM LiF,
Boeing Scientific Research Labs Seattle Wash Flight Sciences Lab
J. Doyle McClure. Oct 69, 20p Rept no. D1-82-0920

Descriptors: (*Helium group gases, *Molecular beams), (*Lithium fluorides, Scattering), Crystal lattices.
Identifiers: *Rainbow scattering, *Gas surface interactions.

Structural attributes of calculated surface-rainbow intensity maxima are shown to agree qualitatively with bilobate intensity structure observed in thermal beams of rare gases scattered from single crystal LiF; the scope of correlation encompasses structural variations due to changes in beam energy, angle of incidence, beam specie, and atomic spacing in the azimuth of the incidence plane. These results, which are based on 2D model calculations, imply that mechanisms associated with the bilobate structure differ substantially from those suggested previously. The subject calculations, along with preliminary 3D model calculations, lead to the expectation that a quantitative calculational description of the observed bilobate structure can be obtained. (Author)
AD-698 138 HC$3.00 MF$0.65

EFFECT OF MASS OSCILLATIONS ON THE IGNITABILITY OF A HETEROGENEOUS SYSTEM.
Stanford Research Inst Menlo Park Calif
For primary bibliographic entry see Field 21B.
AD-698 151 HC$3.00 MF$0.65

OXIDATION OF AMMONIA CATALYZED BY MIXED OXIDES OF COPPER AND CHROMIUM.
Stanford Research Inst Menlo Park Calif
For primary bibliographic entry see Field 7B.
AD-698 152 HC$3.00 MF$0.65

PHOTOFRAGMENT SPECTROSCOPY OF DISSOCIATIVE EXCITED STATES,
California Univ San Diego La Jolla Dept of Chemistry
Kent R. Wilson. 1 Dec 69, 46p
Contracts N00014-67-A-0109-0013, DA-31-124-ARO (D)-257

Descriptors: (*Molecular energy levels, Dissociation), (*Molecular spectroscopy, Molecular energy levels), (*Mass spectroscopy, Molecular energy levels), Photon bombardment, Electron transitions, Nitrogen oxides.
Identifiers: Photochemical recoil spectroscopy, Photochemical dissociation, Nitrosyl chloride, *Recoil spectroscopy.

A new form of molecular spectroscopy was developed to study dissociative excited electronic states. A molecular beam is crossed by pulses of polarized light and the distribution of recoiling photodissociation fragments is measured by a mass-spectrometer as a function of energy of the photons, mass of the fragments, translational energy of the fragments, and angle of fragment recoil with respect to the polarization direction. In experi-

ments with a variety of molecular transitions it is shown that such information as the transition moment direction, the upper state symmetry, the identification of the fragments and their internal states, the bond strengths and the molecular dynamics of dissociation may be deduced from this multi-dimensional distribution. (Author)
AD-698 158 HC$3.00 MF$0.65

MASS SPECTROMETRIC STUDY OF ION-NEUTRAL REACTIONS IN RADIOFREQUENCY DISCHARGES IN CARBON DIOXIDE.
Technical rept.,
Purdue Univ Lafayette Ind Project Squid Headquarters
J. G. Collins, J. L. Franklin, and Steven M. Schildcrout. Sep 69, 31p Rept no. SQUID-TR-RICE-8-PU
Contract N00014-67-A-0226-0005
Prepared in cooperation with Rice Univ., Houston, Tex.

Descriptors: (*Carbon dioxide, Gas discharges), (*Radio waves, Gas discharges), (*Gas discharges, Radiofrequency), Mass spectroscopy, Ions, Reaction kinetics, Oxygen.
Identifiers: *Ion-molecule interactions, Squid project.

Abundances of positive ions and neutral molecules emanating from an active radiofrequency discharge in CO2 at pressures from 0.01 to 1 torr have been determined mass-spectrometrically. The data are used to evaluate rate constants for ion-neutral reactions occurring in the discharge. The results are in agreement with previous results for reactions occurring in an electron-impact ion source and in thermalized flowing afterglows. The large yield of O2 (+) at the higher discharge pressures is attributed mainly to charge transfer to O2, the significance of which is enhanced by an increase in effective reaction time with increased CO2 pressure. (Author)
AD-698 192 HC$3.00 MF$0.65

STUDIES IN CHEMICAL DYNAMICS AND RADIATION CHEMISTRY.
California Inst. of Tech., Pasadena.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 23 23.
CALT-767-P-4-54 HC$3.00 MF$0.65

SENSITIVITY OF NUCLEAR MAGNETIC DOUBLE RESONANCE,
Illinois Univ., Urbana.
Paul Roger Spencer. Oct 69, 121p
Contract AT (11-1)-1198

Descriptors: (*Nuclear Magnetic resonance, Sensitivity), Solid state physics, Impurities, Nuclear spins, Theses.
Identifiers: *Nuclear magnetic double resonance.

For abstract, see NSA 23 23.
COO-1198-663 HC$3.00 MF$0.65

SPECIFIC ATTRACTIONS IN ION EXCHANGE.
Final rept.,
Colorado Univ., Boulder.
Harold F. Walton. 24 Sep 69, 5p
Contract AT (11-1)-499

Descriptors: (*Ion exchange, *Chromatographic analysis), Amines, Chemical equilibrium, Metals.
Identifiers: Phenethylamines.

For abstract, see NSA 23 23.
COO-499-21 HC$3.00 MF$0.65

25 YEARS OF RARE EARTHS. A BIBLIOGRAPHY OF RARE-EARTH RESEARCH PAPERS AND REPORTS PUBLISHED BY THE AMES LABORATORY FROM ITS FOUNDING TO ITS 25TH ANNIVERSARY,
Ames Lab., Iowa.
For primary bibliographic entry see Field 7B.
For abstract, see NSA 23 23.
IS-RIC-2 HC$3.00 MF$0.65

GROUP IV AND V TRANSITION METAL RICH CHALCONIDE X-RAY POWDER DIFFRACTION DATA,
Ames Lab., Iowa.
For primary bibliographic entry see Field 20B.
For abstract, see NSA 23 23.
IS-2133 HC$3.00 MF$0.65

VOLUMETRIC ESTIMATION OF ASCORBIC ACID WITH TETRAVALENT MANGANESE,
Mound Lab., Miamisburg, Ohio.
G. L. Silver. 26 Sep 69, 7p*
Contract AT (33-1)-GEN-53

Descriptors: (*Manganese, *Oxidation), (*Permanganates, *Reduction (Chemistry)), (*Volumetric analysis, Manganese), Oxidation-reduction reactions.

For abstract, see NSA 23 23.
MLM-1689 HC$3.00 MF$0.65

TABLES OF DIELECTRIC DISPERSION DATA FOR PURE LIQUIDS AND DILUTE SOLUTIONS,
National Bureau of Standards, Washington, D.C.
Floyd Buckley, and Arthur A. Maryott. 1 Nov 58, 101p
Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.50.

Descriptors: (*Organic compounds, *Dielectric properties), (*Inorganic compounds, Dielectric properties), Liquids, Solutions, Hydrocarbons, Alcohols, Halogenated hydrocarbons, Ketones, Carboxylic acids, Water, Sulfuric acid, Amines, Phenols, Deuterated compounds.

Primary dielectric dispersion data and characteristic dispersion parameters are tabulated for almost 200 substances in the liquid state and for dilute aqueous and nonaqueous solutions with more than 150 solutes. There are 6 tables and 1 section of graphs. There are 4 tables for pure liquids, 2 containing summaries of the derived dispersion parameters and 2 containing the primary data. The section on graphs supplements the tables for pure liquids and contains reproductions of pertinent data that are available only in the form of graphs. (Author)
NBS-Circ-589 HC$0.50 MF$0.65

BIBLIOGRAPHY ON THE HIGH TEMPERATURE CHEMISTRY AND PHYSICS OF MATERIALS,
National Bureau of Standards, Washington, D.C. Inst. for Materials Research.
J. J. Diamond. Oct 69, 96p*
Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.00.

Descriptors: (*High-temperature research, Bibliographies), (*Refractory materials, Bibliographies), (*Spectra (Visible+ ultraviolet), Gases), Laboratory equipment, Furnaces, Thermocouples, Pyrometers, Thermodynamics, Phase studies, Molecular energy levels, Thermochemistry, Physical properties, Chemical properties, Luminescence.

The bibliography consists of references to research involving temperatures above 1000C, which were noted by the Contributors during the above three-month period. Since the report is intended primarily as a current-awareness bibliography, there is no cross-referencing or indexing. There are about 825 references roughly grouped under fifteen subject headings. (Author)
NBS-SP-315-3 HC$1.00 MF$0.65

A BIBLIOGRAPHY OF THERMOPHYSICAL PROPERTIES OF AIR FROM 0 TO 300 K,
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
L. A. Hall. Oct 69, 127p* R-546
Paper copy also available from Superintendent of Documents, GPO, Washington, D. C. 20402. $1.25.

Descriptors: (*Air, Bibliographies), (*Thermodynamics, Air), (*Cryogenics, Air), Thermodynamics, Transport properties, Equations of state, Compressive properties, Vapor pressure, Specific heat, Diffusion, Refractive index.
Identifiers: *Thermophysico properties.

Reference together with an abbreviated abstract are presented for mechanical, thermodynamic, and transport properties of air from 0 to 300 K published up to December 1968. A total of 610 articles have been indexed. Each article has been reviewed and coded with regard to properties studied, type of article (i.e., experimental, theoretical, etc.), and method of presentation of data. The temperature and pressure ranges for each property under consideration are also given. An index has been prepared according to property with four subcategories: solid, liquid, gas up to 200 K, and gas above 200 K. (Author)
NBS-TN-383 HC$1.25 MF$0.65

HIGH TEMPERATURE PROPERTIES AND DECOMPOSITION OF INORGANIC SALTS. PART 2. CARBONATES,
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
For primary bibliographic entry see Field 7B.
NSRDS-NBS-30 HC$0.45 MF$0.65

PHASE INTERFERENCE EFFECTS IN INELASTIC He++ He COLLISIONS,
Columbia Univ., New York.
H. Rosenthal, and H. M. Foley. 1968, 12p

Descriptors: (*Helium bombardment, Helium), Ion bombardment, Inelastic scattering, Excitation, Atomic energy levels.

For abstract, see NSA 23 23.
NYO-1932 (2)-154 HC$3.00 MF$0.65

PHOTOELECTRON SPECTROSCOPY FOR SOME AUTOIONIZED STATES OF MOLECULAR OXYGEN.
Adelaide Univ. (Australia). Physics Dept.
J. L. Bahr, A. J. Blake, J. H. Carver, and V. Kumar. Jan 69, 21p AD-690653, ADP-68
Contract AF-AFOSR-1131-66

Descriptors: *Ionized gases, *Photoelectrons, *Spectroscopy, Oxygen, Resonance, Vibration.

For abstract, see STAR 07 24.
N69-40052 HC$3.00 MF$0.65

IONIZATION AND METASTABLE EXCITATION IN LOW- ENERGY COLLISIONS OF GROUND STATE ARGON ATOMS.
Denver Univ., Colo. Dept. of Physics.
R. C. Amme, and P. O. Haugsjaa. 1969, 12p
NASA-CR-106343
Contract NGR-06-004-006

Descriptors: *Argon, *Atomic collisions, *Atomic excitations, *Ionization, Activation energy, Atomic beams, Hydrogen, Ionization cross sections, Metastable state.

For abstract, see STAR 07 24.
N69-40073 HC$3.00 MF$0.65

ELECTROCHEMICAL BEHAVIOR OF THE ALUMINUM ELECTRODE IN MOLTEN SALT ELECTROLYTES.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
B. S. Del Duca. Oct 69, 30p NASA-TN-D-5503
Contract 120-34

Descriptors: *Aluminum, *Electrochemistry, *Electrodes, *Molten salt electrolytes, Charge transfer, Electrodeposition, Surface diffusion.

For abstract, see STAR 07 24.
N69-40240 HC$3.00 MF$0.65

VAPOR PHASE GROWTH TECHNIQUE AND SYSTEM FOR SEVERAL 3-5 COMPOUND SEMICONDUCTORS QUARTERLY TECHNICAL REPORT.
Radio Corp. of America, Princeton, N. J.
For primary bibliographic entry see Field 20L.
For abstract, see STAR 07 24.
N69-40423 HC$3.00 MF$0.65

HEATS OF FORMATION OF LIGHT ELEMENT COMPOUNDS PROGRESS REPORT, 1 JAN. - 31 MAR. 1969.
Fulmer Research Inst., Ltd., Stoke Poges (England).
G. C. Curme, P. Gross, C. Hayman, and R. H. Lewin. 28 Apr 69, 8p AD-691487, R.163/34
Contract AF 61/052/-863

Descriptors: *Borides, *Heat of formation, *Iodides, Aluminum compounds, Beryllium compounds, Liquefied gases, Thermochemistry, Titanium compounds.

For abstract, see STAR 07 24.
N69-40822 HC$3.00 MF$0.65

STUDIES OF THE REACTION KINETICS ON THE RADICAL ANIONS OF P-NITROBENZOIC ACID AND NITROBENZENE BY MEANS OF ELECTRON SPIN.
Reaktionskinetische Untersuchungen An Den Radikalanionen Der P-nitrobezoesaeure Und des Nitrobenzols Mit Hilfe Der Elektronenspinresonanz Elektronenspinresonanz
Technische Hochschule Munchen (West Germany).
D. Kolb. 1969, 68p
Lang- in German

Descriptors: *Anions, *Electron paramagnetic resonance, *Nitrobenzenes, *Radicals, *Reaction kinetics, *Spectroscopic analysis, Concentration (composition), Interlayers, Ph factor, Reduction (chemistry), Transition probabilities.

For abstract, see STAR 07 24.
N69-40841 HC$3.00 MF$0.65

EXCERPT FROM THE DISSOLUTION OF SOLID PHASES IN TURBULENT LIQUIDS IN THE PRESENCE OR ABSENCE OF SECONDARY CHEMICAL REACTIONS.
Auszug Aus Zur Aufloesung Fester Phasen in Turbulent Bewegten Fluessigkeiten Bei An- Und Abuesenheit Chemischer Folgereaktionen
Technische Hochschule Munchen (West Germany).
H.-F. Klunker. 1969, 26p
Lang- in German

Descriptors: *Boundary layers, *Dissolving, *Liquid-solid interfaces, *Reaction kinetics, *Solids, Chemical equilibrium, Fluid flow, Turbulent diffusion, Turbulent flow.

For abstract, see STAR 07 24.
N69-40882 HC$3.00 MF$0.65

INTERACTION OF 42- ME V ALPHA PARTICLES WITH HELIUM-3.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
E. T. Boschitz, and J. S. Vincent. Nov 69, 20p
NASA-TN-D-5530
Contract 129-02

Descriptors: *Alpha particles, *Born approximation, *Elastic scattering, *Helium isotopes, *Scattering cross sections, Excitation, Polarization (spin alignment), Potential theory, Two body problem.

For abstract, see STAR 07 24.
N69-40979 HC$3.00 MF$0.65

ESTIMATED GAS COMPOSITIONS IN EQUILIBRIUM WITH CONDENSED PHASES OF THE CS- O SYSTEM.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
L. K. Tower. 22 Oct 69, 20p NASA-TM-X-52702

Descriptors: *Cesium, *Equilibrium, *Gas composition, *Oxygen, *Vapor phases, Condensing, High temperature, Thermionic converters, Work functions.

For abstract, see STAR 07 24.
N69-41019 HC$3.00 MF$0.65

STUDIES OF THE NONLINEAR OPTICS OF STIMULATED BRILLOUIN SCATTERING AND INDUCED TRANSPARENCE IN THE WAVELENGTH RANGE AT 10 MU.
Technische Hochschule Munchen (West Germany).
For primary bibliographic entry see Field 20L.
For abstract, see STAR 07 24.
N69-41038 HC$3.00 MF$0.65

BIBLIOGRAPHY OF ATOMIC AND MOLECULAR PROCESSES FOR JANUARY-JUNE 1965.
Oak Ridge National Lab., Tenn.
Jun 67, 156p

Descriptors: (*Particle beams, Bibliographies), (*Helium group gases, Interactions), Luminescence, Dissociation, Scattering, Upper atmosphere, Lasers, Photons, Molecular energy levels.
Identifiers: *Collision cross sections, *Ion molecule interactions, *Atom ion interactions.

For abstract, see NSA 23 23.
ORNL-AMPIC-4 HC$3.00 MF$0.65

DISSOCIATION PRESSURE OF BISMUTH IN THE SYSTEM: BISMUTH-THORIUM.
Oak Ridge National Lab., Tenn.
Olaf Dahlke, Wigbert Gans, Ottmar Knacke, and Franz Mueller. 1969, 8p
Trans. of Zeitschrift fuer Metalkunde (West Germany) v60 n5 p465-468 1969, by C. E. Schilling, and R. G. Mansfield.

Descriptors: (*Bismuth alloys, *Phase studies), (*Thorium alloys, Phase studies), (*Intermetallic compounds, Thorium alloys), Phase diagrams, West Germany.
Identifiers: Bismuth thorium, Thorium intermetallics, Bismuth intermetallics.

For abstract, see NSA 23 23.
ORNL-tr-2218 HC$3.00 MF$0.65

A PHYSICO-CHEMICAL STUDY OF SOME AREAS OF FUNDAMENTAL SIGNIFICANCE TO BIOPHYSICS.
Annual rept. 1968-69,
Louisiana State Univ., Baton Rouge.
S. P. McGlynn. 15 May 69, 24p
Contract AT (40-1)-3018

Descriptors: (*Hydroxides, *Phosphorescence), (*Carboxylic acids, *Luminescence), Doping, Crystal lattices, Electron transitions, Free radicals.
Identifiers: *Hydroxyl radical.

For abstract, see NSA 23 23.
ORO-3018-53 HC$3.00 MF$0.65

A VERSATILE MOLECULAR BEAM APPARATUS UTILIZING ELECTRON BOMBARDMENT DETECTION: OBSERVATION OF THE RAINBOW EFFECT FOR ARGON-NITROGEN.
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
For primary bibliographic entry see Field 14B.
PB-188 011 HC$3.00 MF$0.65

STRUCTURE OF THE TRANSITION QUINTUPLET D (e) TO SEPTET F (2) IN EUROPIUM BENZOYLACETONATE IN SOLUTION (Structure de la Transition quintuplet D (e) to septet F (2) dans le Benzoylacetonate d'Europium en Solution).
California Univ., Berkeley. Lawrence Radiation Lab.
Yves Meyer, Henri Poncet, and Marcel Verron. Oct 69, 9p UCRL-Trans-10401
Trans. from Academie des Sciences, Paris. Comptes Rendus (France) v259 n1, 6 Jul 64, by N. Davren.

Descriptors: (*Chelate compounds, Europium compounds), (*Europium compounds, *Fluorescence), Cryogenics, Electron transitions, Spectra (Visible+ ultraviolet), Molecular energy levels, Synthesis (Chemistry), France.
Identifiers: *Pentane dione complexes, Emission spectra, Europium/tris (phenyl-1-3-butanedionato), Matrix isolation techniques, Translations.

The addition of certain compounds to solutions of eruopium benzoylacetonate in a mixture of ethanol and methanol reduces the width of the fluorescence lines (to 5 A) and increases the lifetime of the excited state. The spectra obtained at 77K between 6100 and 6200 A are presented. These additions enable us to account for the spectroscopic differences in the spontaneous and stimulated emission of chelates according to the method of synthesis. (Author)
PB-188 096T HC$3.00 MF$0.65

HYDROTHERMAL SYNTHESIS OF CHRYSOBERYL (Hydrothermalsynthese von Chrysoberyll),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 20B.
PB-188 097T HC$3.00 MF$0.65

PROGRESS REPORT FOR THE PROJECT (10TH) 'RESEARCH ON THE CHEMICAL PROPERTIES OF METAL CHELATES',
California Univ., Riverside. Dept. of Chemistry.
For primary bibliographic entry see Field 7B.
PB-188 098 HC$3.00 MF$0.65

CONTRIBUTION TO THERMOANALYTICAL STUDY OF THE DECOMPOSITION AND REDUCTION OF SULFATES (I),
Oak Ridge National Lab., Tenn.
A. J. Hegedues, and K. Fukker. 1969, 12p ORNL-tr-1616
Trans. of Zeitschrift fuer Anorganische und Allgemeine Chemie (East Germany) v284 p20-30 1956, by C. E. Schilling, and R. Gregg Mansfield.

Descriptors: (*Sulfates, *Thermogravimetric analysis), Decomposition, Sulfides, Reduction (Chemistry), Alkali metal compounds, Alkaline earth compounds, East Germany.
Identifiers: Group 3A compounds, Translations.

Decomposition temperatures were determined for sulfates of the various elements and corresponding transition elements in groups I, II, and III of the periodic system by means of thermogravimetric analysis (TGA) in air at one atmosphere pressure in the temperature range 20/1000C. In parallel experiments in the same temperature range, weight-temperature curves were traced for the reduction of these same sulfates in a current of pure hydrogen as well as a mixture of 30% hydrogen in nitrogen. (Author)
PB-188 099T HC$3.00 MF$0.65

TABLE OF DIELECTRIC CONSTANTS OF PURE LIQUIDS.
National Bureau of Standards, Washington, D.C.
Arthur A. Maryott, and Edgar R. Smith. 10 Aug 51, 51p NBS-Circ-514

Des riptors: (*Dielectric properties, *Organic compounds), (*Inorganic compounds, Dielectric properties), Tables.

The 'static' dielectric constants of more than 800 substances in the liquid state were critically examined and tabulated in concise form. The table consists of three sections: (A) Standard liquids; (B) Inorganic liquids; and (C) Organic liquids. An indication of the probable accuracy of the data is given. Wherever feasible, a simple analytical function is employed to express the variation of dielectric constant with temperature. (Author)
PB-188 203 HC$3.00 MF$0.65

OIL DISPERSING CHEMICALS. A STUDY OF THE COMPOSITION, PROPERTIES AND USE OF CHEMICALS FOR DISPERSING OIL SPILLS.
Federal Water Pollution Control Administration, Edison, N.J. Water Quality Lab.
For primary bibliographic entry see Field 13B.
PB-188 207 HC$3.00 MF$0.65

THE KINETICS OF ADSORPTION OF METHANE AND NITROGEN FROM HYDROGEN GAS. (B-2),
National Bureau of Standards, Boulder, Colo. Inst. for Basic Standards.
A. J. Kidnay, M. J. Hiza, and P. F. Dickson. 1968, 8p R-528
Pub. in Advances in Cryogenic Engineering, v14, p41-48, Proceedings of the Cryogenic Engineering Conference, Cleveland, Ohio, 19-21 Aug 68.

Descriptors: (*Gases, *Adsorption), (*Methane, Adsorption), (*Nitrogen, Adsorption), (*Carbon, Adsorption), Cryogenics, Hydrogen, Kinetic theory, Impurities.
Identifiers: Column packings.

The breakthrough curves for four binary mixtures (two nitrogen-hydrogen and two methane-hydrogen) were measured on an activated coconut shell charcoal at 76K and over a wide range of flow rates. The equations of Eagleton and Bliss were used to obtain gas-phase and adsorbed-phase mass transfer coefficients from the breakthrough curves. (Author)
PB-188 220 HC$3.00 MF$0.65

EQUILIBRIUM GAS-PHASE COMPOSITIONS OF ETHANE AND ETHYLENE IN BINARY MIXTURES WITH HELIUM AND NEON BELOW 150 KAND A CORRELATION FOR DEVIATIONS FROM THE GEOMETRIC MEAN COMBINING RULE. (B-1),
National Bureau of Standards, Boulder, Colo. Inst. for Basic Standards.
M. J. Hiza, and A. G. Duncan. 1968, 11p R-527
Pub. in Advances in Cryogenic Engineering, v14 p30-40. Proceedings of the Cryogenic Engineering Conference, Cleveland, Ohio. 19-21 Aug 68.

Descriptors: (*Cryogenics, *Phase studies), (*Ethylenes, Phase studies), Chemical equilibrium, Helium, Neon.
Identifiers: Ethane.

The purpose of the present study was to measure equilibrium gas-phase compositions for the helium and neon-binary systems with ethane and ethylene in the temperature range below 150 K corresponding to those for the hydrogen systems. The present results complete a set of nine binary systems containing hydrogen, helium, and neon, with three different light hydrocarbons as the common second component. Based on these data and other data critically selected from the literature, a correlation has been developed relating the deviation from the geometric mean combining rule to the ionization potentials of the pure components in the binary mixture. (Author)
PB-188 221 HC$3.00 MF$0.65

STATISTICAL THERMODYNAMICS OF SIMPLE LIQUID MIXTURES: HENRY'S CONSTANTS,
California Univ., Berkeley. Dept. of Chemical Engineering.
For primary bibliographic entry see Field 20M.
PB-188 224

CHEMISTRY IN NONAQUEOUS SOLVENT SYSTEMS. A TEN-YEAR ANNOTATED BIBLIOGRAPHY,
Dow Chemical Co., Golden, Colo. Rocky Flats Div.
William R. Strickland. 18 Aug 69, 17p*
Contract AT (29-1)-1106

Descriptors: (*Organic solvents, *Bibliographies), (*Sulfoxides, Organic solvents), (*Electrochemistry, Organic solvents), Acetamides, Acetic acids, Acetonitriles, Acids, Formamides, Pyridines.
Identifiers: *Methyl sulfoxide.

For abstract, see NSA 23 23.
RFP-1339 HC$3.00 MF$0.65

COLLISION SPECTROSCOPY OF 2 TRIPLET S EXCITATION IN He BY He+ IMPACT,
Stanford Research Inst., Menlo Park, Calif.
Dewitt Coffey, Jr., F. T. Smith, and D. C. Lorents.
28 Jul 69, 5p CONF-690702-6
Presented at the International Conference on the Physics of Electronic and Atomic Collisions (6th), Cambridge, Mass. Jul 69.

Descriptors: (*Helium, *Helium bombardment), Excitation, Inelastic scattering, Atomic spectroscopy, Atomic energy levels.

For abstract, see NSA 23 23.
SRIA-115-P-78-1 HC$3.00 MF$0.65

STUDY OF FISSION-FRAGMENT-INDUCED NUCLEATION OF BUBBLES IN SUPERHEATED WATER,
Stanford Univ., Calif. Nuclear Engineering Lab.
L. W. Deitrich. Apr 69, 107p
Contract AT (04-3)-326

Descriptors: (*Bubble chambers, Bubbles), (*Bubbles, Nucleation), Fission products.

For abstract, see NSA 23 23.
SU-326-P-13-4 HC$3.00 MF$0.65

COMPUTER PROGRAMS FOR AN IMPROVED EQUATION OF STATE (ES68Z AND ES68M),
California Univ., Berkeley. Lawrence Radiation Lab.
Otto Redlich, and Victoria B. T. Ngo. May 69, 69p
Contract W-7405-eng-48

Descriptors: (*Equations of state, *Computer programs), Enthalpy, Entropy.
Identifiers: ES68Z computer program, ES68M computer program.

For abstract, see NSA 23 23.
UCRL-19011 HC$3.00 MF$0.65

THE VAPOR PRESSURE OF PENTAERYTHRITOL TETRANITRATE (PETN) IN THE TENPERATURE RANGE OF 50 TO 98 DEGREES CENTIGRADE,
California Univ., Livermore. Lawrence Radiation Lab.
Francis T. Crimmins. 11 Jul 69, 11p

Descriptors: (*PETN, *Vapor pressure), (*Heat of sublimation, PETN).

For abstract, see NSA 23 23.
UCRL-50704 HC$3.00 MF$0.65

7E. Radio and Radiation Chemistry

THE DEVELOPMENT OF A PHOTOTROPIC ANODIZED ALUMINUM FINISH RESPONSIVE TO GAMMA RADIATION.
Final technical rept. 1 Apr 66-30 Apr 67,
North Star Research and Development Inst Minneapolis Minn
Myron E. Browning, and Teman L. Burks. Jul 67, 79p Rept no. W-90-F
Contract DA-44-009-AMC-1549 (T)
Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Photochromism, *Gamma rays), (*Radiation monitors, Photochromism), (*Aluminum coatings, Radiation monitors), (*Dyes, Photochromism), Anodic coatings, Free radicals, Radiation chemistry, Methylene blue, Spectra (Visible+ ultraviolet), N-heterocyclic compounds, Amines.
Identifiers: *Phototropism, *Tetrazolium compounds, Tetrazolium/dimethoxybiphenylene-bis (2-nitrophenyl-5-phenyl-), Thiazine dyes, Triphenylmethane dyes, Diphenylmethane dyes, Malachite green, Phenylenediamine/N-methoxyphenyl, CI Basic Green 1.

The present investigation was conducted to establish a phototropic anodized aluminum finish sensitive to gamma radiation. A comprehensive literature search revealed a number of candidate phototropic materials but very little information about gamma radiation response. Because early trials indicated that each candidate phototropic system possessed different dyeing characteristics for an anodic film, time-consuming trials with dyed anodic films were reduced by examining gamma radiation response to solutions of the phototropic materials. Color response could be detected in some systems at radiation levels as low as 20,000 roentgens depending on the dye concentration. Further studies disclosed three systems that have favorable color response to gamma radiation. These included certain triarylmethane dyes, a thiazine dye system, and systems using pH-indicator dyes as dyes per se. Studies of these phototropic dyes revealed that special attention will be required in anodizing, dyeing, and sealing techniques to obtain the best radiation response for the coated specimens. (Author)
AD-698 037 HC$3.00 MF$0.65

ESR SPECTRA OF ORIENTED POLYTETRAFLUOROETHYLENE SUBJECTED TO 20-nsec PULSES OF ELECTRONS,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
N. R. Lerner. 14 Mar 68, 9p
Availability: Pub. in Jnl. of Chemical Physics, v50 n7 p2902-2910, 1 Apr 69. No copies furnished.

Descriptors: (*Halocarbon plastics, *Electron spin resonance), (*Electron bombardment, Halocarbon plastics), (*Radiation chemistry, Halocarbon plastics), Degradation, Free radicals, Fluorine compounds, Oxidation, Oxygen.
Identifiers: *Tetrafluoroethylene resins, Fluorinated polymers.

Samples of oriented polytetrafluoroethylene have been subjected to irradiation from a pulsed electron beam generator. The duration of the pulses was 20 nsec, and doses ranging from 0.8-14 Mrad were delivered to the samples. Working with oriented samples makes it possible to distinguish and identify two distinct species in the samples irradiated in air. The relative concentration of the two species varies as a function of the dose. In samples receiving larger doses of radiation the species -CF2- (CF-O-O)-CF2-dominates the ESR spectrum. At lower doses the species -CF2-O-O. makes a larger relative contribution to the ESR spectrum. Samples were also subjected to irradiation in vacuum. The ESR spectra obtained from the vacuum-irradiated samples before and after the admission of air is discussed. Samples were subjected (in air) to radiation from a 60Co source, ranging from 5-30 Mrad, at a dose rate of 0.43 Mrad/h. The species -CF2-O-O. dominates the ESR spectrum of 60Co irradiated samples. The details of the line shapes of the ESR spectra of samples irradiated in air are discussed. (Author)
AD-698 051

EFFECT OF THE METAL SUPPORT ON PHOTOLYSIS OF AN ADDUCT WITH URETHANE AND ISOCYNATE GROUPS,
Army Foreign Science and Technology Center Washington D C
N. P. Kurgan. 7 Nov 69, 12p Rept no. FSTC-HT-23-414-69
Trans. of Unidentified Russian language article, 1968.

Descriptors: (*Isocyanate plastics, *Photolysis), Ultraviolet radiation, Zinc, Tin, Copper, Catalysis, Glass, Spectra (Visible+ ultraviolet).
Identifiers: *Urethanes, Photochemical reactions, Carbanilic acid/ ((ethyl-hydroxymethyl)propanediol-triester)-isocyanato-methyl.

The compound, 3-isocyanato-4-methyl carbanilic acid triester with 2-ethyl-2- (hydroxymethyl)-1-3-propanediol, was photolyzed to help clarify the effects of metals surfaces in the photolysis of polyurethanes.
AD-698 171 HC$3.00 MF$0.65

STUDIES IN CHEMICAL DYNAMICS AND RADIATION CHEMISTRY.
Technical progress rept.,
California Inst. of Tech., Pasadena.
Aron Kuppermann. 1 Jul 69, 35p
Contract AT (04-3)-767

Descriptors: (*Molecular beams, Scattering), (*Photolysis, Chemical reactions).
Identifiers: Photoelectron spectroscopy.

For abstract, see NSA 23 23.
CALT-767-P-4-54 HC$3.00 MF$0.65

THE RADIATION CHEMISTRY OF HIGH POLYMERS.
Final rept.,
Northwestern Univ., Evanston, Ill. Dept. of Chemistry.
Malcolm Dole. Sep 69, 17p
Contract AT (11-1)-1088

Descriptors: (*Radiation chemistry, *Polymerization), Vinyl plastics, Crosslinking (Chemistry), Free radicals, Polyethylene plastics.
Identifiers: Chemical reaction mechanisms.

For abstract, see NSA 23 23.
COO-1088-37 HC$3.00 MF$0.65

FORMATION OF PARTICLE TRACKS.
Nebraska Univ., Lincoln. Behlen Lab. of Physics.
For primary bibliographic entry see Field 18D.
For abstract, see NSA 23 23.
COO-1671-18 HC$3.00 MF$0.65

BIBLIOGRAPHY ON THE RADIATION CHEMISTRY OF AQUEOUS SOLUTIONS. I. AMINO ACIDS.
Notre Dame Univ., Ind. Radiation Lab.

Aug 69, 18p*
Revision of rept. dated 25 Nov 68.

Descriptors: (*Amino acids, *Radiation chemistry), (*Bibliographies, Radiation chemistry), Solutions, Biochemistry.

For abstract, see NSA 23 23.
COO-38-641 HC$3.00 MF$0.65

RADIATION EFFECTS IN BIOCHEMISTRY AND ORGANIC CHEMISTRY.
Colorado Univ., Boulder.
For primary bibliographic entry see Field 6R.
For abstract, see NSA 23 23.
COO-690-34 HC$3.00 MF$0.65

A MASS SPECTROMETRIC-THERMOGRAVIMETRIC TECHNIQUE FOR EVALUATING THE GAS RELEASE POTENTIAL OF SINTERED THORIA,
Du Pont de Nemours (E. I.) and Co., Aiken, S.C. Savannah River Lab.
Philippe Chastagner. Sep 69, 9p
Contract AT (07-2)-1

Descriptors: (*Thorium, *Radiochemistry), (*Thorium compounds, Mass spectroscopy), Gases, Thermogravimetric analysis.
Identifiers: Thorium dioxide, *Desorption.

For abstract, see NSA 23 23.
DP-1201 HC$3.00 MF$0.65

CONTRIBUTION TO THE SOLUTION CHEMISTRY OF URANIUM (VI).
Contribution A La Chimie de l'Uranium (Vi) en Solution
Commissariat A L Energie Atomique, Grenoble (France). Centre D'etudes Nucleaires.
C. Tsymbal. Jul 69, 103p CEA-R-3476
Lang- in French, English Summary

Descriptors: *Hydroxyl compounds, *Ligands, *Potentiometric analysis, *Uranium compounds, Carbonates, Chemical equilibrium, Coordination polymers, Metal ions, Phase diagrams, Thermodynamic equilibrium.

For abstract, see STAR 07 24.
N69-40215 HC$3.00 MF$0.65

BIBLIOGRAPHIC DISCUSSION ON THE PHYSICO-CHEMICAL BEHAVIOUR AND THE RADIO-ECOLOGY OF ZIRCONIUM IN HYDROBIOLOGICAL SYSTEMS.
Commissariat A L Energie Atomique, Fontenay-Aux-roses (France). Centre D'etudes Nucleaires.
For primary bibliographic entry see Field 18G.
For abstract, see STAR 07 24.
N69-40589 HC$3.00 MF$0.65

DIRECT POWER DETERMINATIONS OF URANIUM IN THE PRESENCE OF OTHER IONS.
Determinazione Potenziometrica Diretta Dell' Uranio in Presenza Di Altri Ioni
Comitato Nazionale Per L Energia Nucleare, Rome (Italy). Laboratorio Technografico.
V. Altamura, A. Canonico, and V. Pompei. 3 Mar 69, 35p RT/CHI/69/12
Lang- in Italian

Descriptors: *Potentiometric analysis, *Solutions, *Titration, *Uranium, Potassium compounds, Reactor technology, Tables (data).

For abstract, see STAR 07 24.
N69-40773 HC$3.00 MF$0.65

RESEARCH CONCERNING IONIC AND FREE RADICAL REACTIONS IN RADIATION CHEMISTRY.
Progress rept. 15 Sep 68-15 Sep 69,
Tennessee Univ., Knoxville. Dept. of Chemistry.
Williams T. Ffrancon. 1969, 11p
Contract AT (40-1)-2968

Descriptors: (*Radiation chemistry, *Polymerization), (*Free radicals, Radiation chemistry), Styrenes, Polymers, Electrons.
Identifiers: Radiolysis, Matrix isolation techniques.

For abstract, see NSA 23 23.
ORO-2968-49 HC$3.00 MF$0.65

EFFECT OF RADIOLYSIS OF TRIBUTYL PHOSPHATE ON PLUTONIUM YIELD IN THE PUREX PROCESS, AT HIGH PLUTONIUM CONTENTS,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18J.
PB-187 967T HC$3.00 MF$0.65

RADIATION CHEMISTRY OF MATERIALS USED IN PLUTONIUM PROCESSING,
Dow Chemical Co., Golden, Colo. Rocky Flats Div.
Armen R. Kazanjian, and Alan K. Brown. 4 Sep 69, 16p
Contract AT (29-1)-1106

Descriptors: (*Radiation chemistry, Organic compounds), (*Reactor fuel processing, Radiation chemistry), Plutonium, Organic solvents, Lubricants, Plastics, Elastomers, Carbon tetrachloride, Polyethylene plastics, Polyvinyl chloride, Air, Silicones.
Identifiers: *Radiolysis, Ethane/trichloro, Propylamines.

For abstract, see NSA 23 23.
RFP-1376 HC$3.00 MF$0.65

EFFECT OF GAMMA RADIATION ON THE DIELECTRIC AND MECHANICAL PROPERTIES OF POLYMETHYL METHACRYLATE AND POLYPROPYLENE (Einfluss von Gamma-Strahlung auf Dielektrische und Mechanische Eigenschaften von Polymethylmethacrylat und Polypropylen),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 11I.
For abstract, see NSA 23 23.
UCRL-Trans-10376 HC$3.00 MF$0.65

SOME STUDIES ON THE OXIDATION STATES OF FISSION-PRODUCT IODINE (129I) IRRADIATED UO2 (LWBR DEVELOPMENT PROGRAM),
Bettis Atomic Power Lab., Pittsburgh, Pa.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
WAPD-TM-851 HC$3.00 MF$0.65

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

FREE AMINO ACIDS AND RELATED SUBSTANCES IN MARINE ORGANISMS.
Final rept. 18 Nov 60-31 Oct 69,
City of Hope Medical Center Duarte Calif
Eugene Roberts, and J. S. Kittredge. Dec 69, 24p*
Contract Nonr-3001 (00)

Descriptors: (*Marine biology, *Amino acids), (*Plankton, *Organic phosphorus compounds), (*Thin layer chromatography, Amino acids), Enzymes, Biosynthesis, Invertebrates.
Identifiers: *Phosphonic acids, *Anemones, Zooplankton, Phosphonic acid/aminoethyl,

Aminotransferases, Phosphonic acid/(methylamino)ethyl, Coelenterata.

A survey of the free amino acids of over 400 tissues of marine organisms revealed a number of new compounds. An acidic amino acid was isolated from sea anemones and proved to be 2-aminoethylphosphonic acid (2-AEP). A new lipid, ceramide 2-amino-ethylphosphonic acid was isolated from sea anemones and characterized. Investigation of precursors of 2-AEP led to the isolation of a new alpha-amino acid, phosphonoalanine. The analogy of these with common nitrogenous bases led to the discovery of three more C-P compounds, N-methyl-2 AEP, N-dimethyl-2 AEP. Lipids containing the mono and trimethyl compounds were isolated. An investigation of the degradation of 2-AEP demonstrated the existence of a transaminase in Anthopleura and Tetrahymena using alpha-ketoglutarate as an acceptor. A study of the transport of aminoalkylphosphonic acids by bacteria revealed that they are taken up by the alpha-amino acid transport system. Biosynthesis of 2-AEP was shown to occur only during cell division and studies with 14C labeled precursors indicated that the most likely precursor is either phosphoenolpyruvic acid or oxaloacetate. Examination of zooplankton revealed that 3% of the total phosphorus was in C-P compounds. Cultures of coccolithophorids and dinoflagellates in labeled media demonstrated that these phytoplankton synthesize phosphonic acids. (Author)
AD-697 976 HC$3.00 MF$0.65

BIBLIOGRAPHIC DISCUSSION ON THE PHYSICO-CHEMICAL BEHAVIOUR AND THE RADIO-ECOLOGY OF ZIRCONIUM IN HYDROBIOLOGICAL SYSTEMS.
Commissariat A L Energie Atomique, Fontenay-Aux-roses (France). Centre D'etudes Nucleaires.
For primary bibliographic entry see Field 18G.
For abstract, see STAR 07 24.
N69-40589 HC$3.00 MF$0.65

8B. Cartography

SOME LABELING THEOREMS FOR PLANAR LINEAR GRAPHS: A CONTRIBUTION TO THE FOUR-COLOR PROBLEM.
Naval Research Lab Washington D C
For primary bibliographic entry see Field 12A.
AD-697 922 HC$3.00 MF$0.65

USE OF AERIAL METHODS IN LANDSCAPE STUDIES,
Army Foreign Science and Technology Center Washington D C
S. V. Viktorov. 21 Oct 69, 409p Rept no. FSTC-HT-23-1101-68
Trans. of unidentified Russian language mono. pub. by Academy of Sciences, 1959.

Descriptors: (*Terrain, Mapping), (*Mapping, *Aerial photography), Deserts, Sand, Swamps, Grasses, Soils, Erosion, Plants (Botany), Dams, Aerial photographs, Structural geology, USSR.
Identifiers: Translations, Tundra, Tectonics, Steppes.

The collection of articles covers a wide range of problems: The use of aerial methods in the tundra, taiga, stepps, and sandy deserts; the possibilities of aerial methods for the study of regional characteristics of landscapes; and the applications of aerial photography for large-scale mapping. (Author)
AD-698 170 HC$3.00 MF$0.65

PATENT APPLIED FOR STEREOSCOPIC PERSPECTOGRAPH,
Joint Publications Research Service, Washington, D.C.
N. A. Vasilev. 1 Dec 69, 12p
Trans. of A New Photogrammetric Instrument. The Stereoscopic Perspectograph, pub. in Izvestiya Vysshikh Uchebnykh Zavedenii. Geodeziya i Aerofotosemka (USSR) n3 p107-115 1961.

Descriptors: (*Photogrammetry, USSR), (*Photographic processors, Patents), Stereoscopic photography, Aerial photographs, Photographic techniques, Design.
Identifiers: Stereoscopic perspectographs.

The article describes a new instrument which can be used in processing aerial photographs taken with cameras with different focal lengths. The principle of mechanical intersection is used in the instrument. Aerial photographs (negatives, diapositives) are placed horizontally in the instrument and do not participate in the movements. This has made possible a great simplification of the mechanical and optical components. A map is drafted directly in front of the observer under the instrument, which is very convenient. (Author)
JPRS-49348 HC$3.00 MF$0.65

AN ASTRONOMIC-GEODETIC GEOID DETERMINATION FOR WEST GERMANY.
Eine Astronomisch-geodaetische Geoidbestimmung Fuer Westdeutschland
Institut Fuer Angewandte Geodaesie, Frankfurt Am Main (West Germany).
S. Heitz. 1969, 70p
Lang- in German Seri- Its Reihe B, Angew. Geodaesie, Heft Nr. 167

Descriptors: *Astronomical coordinates, *Geodetic surveys, *Geoids, *Germany, Geodetic coordinates, Interpolation, Least squares method, Triangulation.

For abstract, see STAR 07 24.
N69-40905 HC$3.00 MF$0.65

8C. Dynamic Oceanography

INTERACTION OF THE ARCTIC OCEAN WATERS WITH ATLANTIC AND PACIFIC WATERS,
Defence Scientific Information Service Ottawa (Ontario)
V. T. Timofeev. Oct 69, 18p Rept no. T-516-R
Trans. of Okeanologiya (USSR) v3 n4 p569-578 1963, by E. R. Hope.

Descriptors: (*Arctic regions, Ocean currents), (*Ocean currents, Interactions), Sea water, Fluid flow, Volume, Heat transfer, Rivers, Greenland Sea, Norwegian Sea, Denmark, Arctic Ocean, Pacific Ocean, Atlantic Ocean, Straits, USSR, Canada.
Identifiers: Translations, Barents Sea.

The hydrological regime of the Arctic Ocean is to a notable extent decided by the Atlantic and Pacific Ocean currents, and also by the river runoff. All these contribute waters of different physical and chemical characteristics to the Arctic Ocean. Therefore the quantitative calculation of water and heat balance-sheets for each of these sources is a matter of great scientific and practical interest, and is discussed in the report.
AD-697 889 HC$3.00 MF$0.65

INFLUENCE OF THE ATLANTIC WATERS ON CERTAIN FEATURES OF THE HYDROLOGICAL REGIME OF THE ARCTIC BASIN AND ITS CONTIGUOUS SEAS,
Defence Scientific Information Service Ottawa (Ontario)
V. V. Panov, and A. O. Shpaikher. Sep 69, 18p
Rept no. T-529-R
Trans. of Okeanologiya (USSR) v3 n4 p579-589 1963, by E. R. Hope.

Descriptors: (*Arctic regions, Ocean currents), (*Ocean currents, Heat transfer), Salinity, Density, Temperature, Sea water, Cooling, Continental shelves, Thermal conductivity, Turbulence, Ice, Atlantic Ocean, Arctic Ocean, USSR, Canada.
Identifiers: Translations, Isotherms, Arctic Basin.

The purpose of the paper is to show the quantitative influence on the hydrological regime of the Arctic Basin and its bordering seas exerted by the inflowing Atlantic waters, and in particular the year-to-year variations of this influence. (Author)
AD-697 890 HC$3.00 MF$0.65

THE CHESAPEAKE BAY INSTITUTE WAVE FOLLOWER.
Technical rept.,
Johns Hopkins Univ Baltimore Md Chesapeake Bay Inst
Mart Peep, and Ronald J. Flower. Sep 69, 87p Rept nos. TR-58, Ref-69-11
Contract Nonr-4010 (11)

Descriptors: (*Ocean waves, *Probes), Anemometers, Wind, Surfaces, Servomechanisms, Tides, Design.
Identifiers: *Air water interactions.

In studies of wave generation an exploration of the wind field close to the water surface is critical. Such an exploration can be made with a hot-wire or film anemometer mounted on a device driven by a servomechanism which will maintain the anemometer at a fixed distance from the fluctuating water surface. The report describes the wave follower which was designed to hold anemometers at fixed distances from 60 cm to 1 cm from the water surface. It may be used with waves up to 30 cm in height. It allows adjustment for tidal changes in mean water elevation up to 60 cm and for slow vertical scanning. (Author)
AD-697 968 HC$3.00 MF$0.65

RIP CURRENTS. PART 1. THEORETICAL INVESTIGATIONS,
Scripps Institution of Oceanography La Jolla Calif
Anthony J. Bowen. 3 Jul 69, 13p
Contract N00014-69-A-0200-6006
Revision of report dated 27 Jan 69. Prepared in cooperation with Liverpool Univ. (England). Tidal Inst.
Availability: Pub. in Jnl. of Geophysical Research, v74 n23 p5467-5478, 20 Oct 69.

Descriptors: (*Beaches, Ocean currents), (*Ocean currents, Theory), Flow fields, Stresses, Vortices, Shallow water, Interactions, Momentum, Wind, Ocean bottom topography.
Identifiers: *Rip currents, Surf.

The nearshore circulation of water on a plane beach produced by a wave train, normally incident on the beach, which has a longshore variation in wave height is investigated theoretically. The radiation stress arising from the excess flux of momentum due to the presence of the waves is found to provide driving terms for a steady flow pattern only inside the surf zone. A circulation pattern is thus produced by a longshore variation in the radiation stress in the surf zone. In shallow water, the radiation stress is proportional to the square of the wave height. The nearshore circulation is therefore directly related to longshore variation in breaker height, currents flowing seaward where the breaker height is low. When the inertial terms are included in the vorticity equation, an increase in the effective Reynolds number produces a narrowing, and consequently a strengthening, of the seaward flow, which suggests an explanation for the existence of the strong, narrow currents known as rip currents. (Author)
AD-698 073

RAY PATH IN A LINEARLY MOVING INHOMOGENEOUS LAYERED OCEAN MODEL,
Houston Univ., Tex. Dept. of Electrical Engineering.
For primary bibliographic entry see Field 20A.
AD-806 957 HC$3.00 MF$0.65

8E. Geodesy

STATISTICAL STRUCTURE OF AEROLOGIC FIELD ANOMALIES OVER NORTH AMERICA,
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 4B.
AD-698 079 HC$3.00 MF$0.65

SOVIET LASER GEODIMETER.
Foreign Technology Div Wright-Patterson AFB Ohio

5 Aug 69, 5p Rept no. FTD-HT-23-1315-68
Edited trans. of Nauka i Zhizn (USSR) v31 n5 p92 1965, by D. Koolbeck.

Descriptors: (*Surveying, Range finding), (*Range finding, *Lasers), Gallium arsenides, USSR.
Identifiers: Translations, Geodimeters, Gallium arsenide lasers.

The use of lasers in Soviet geodetic instruments has been confirmed by a photograph and brief description of a device called the GD-314 phased-light radio rangefinder. The equipment is designed to measure distances up to 2000 m with an accuracy of 2 cm. The light source is a gallium-arsenide, semiconductor diode laser. The continuous radiation wavelength is 860 nm, and the output is 0.5 mW. Distance measurements are made at radiation frequencies of 100 kc and 10 Mc. There are three component parts of the device: a transmitting and receiving unit weighing 6 kg, a measuring unit weighing 5 kg, and a power supply weighing 15 kg (dry-cell batteries which operate continuously for 50 hours).
AD-698 115 HC$3.00 MF$0.65

INFORMATION RELATIVE TO CARTOGRAPHY AND GEODESY. SERIES 2 - GERMAN CONTRIBUTIONS IN FOREIGN LANGUAGES. NO. 24 - AN ASTRO- GEODETIC DETERMINATION OF THE GEOID FOR WEST GERMANY.
Institut Fuer Angewandte Geodaesie, Frankfurt Am Main (West Germany).
S. Heitz. 1969, 86p
Subm- Submitted for Publication

Descriptors: *Astronomical coordinates, *Geodetic coordinates, *Least squares method, Autocorrelation, Germany, Matrices (mathematics), Triangulation.

For abstract, see STAR 07 24.
N69-40289 HC$3.00 MF$0.65

INFORMATIONS RELATIVE TO CARTOGRAPHY AND GEODESY. SERIES 2 - GERMAN CONTRIBUTIONS IN FOREIGN LANGUAGES. NO. 23 - DETERMINING ATMOSPHERIC REFRACTION FROM THE DISPERSION OF LIGHT.
Institut Fuer Angewandte Geodaesie, Frankfurt Am Main (West Germany).
R. Brein. 1969, 16p
Subm- Submitted for Publication

Descriptors: *Atmospheric refraction, *Dispersions, *Light (visible radiation), *Weather, Geodetic surveys, Measuring instruments.

For abstract, see STAR 07 24.
N69-40337 HC$3.00 MF$0.65

GEOID DETERMINATION BY LEAST SQUARES INTERPOLATION BASED ON MEASURED AND INTERPOLATED DEVIATIONS FROM THE VERTICAL.
Geoidbestimmung Durch Interpolation Nach Kleinsten Quadraten Aufgrund Gemessener Und Interpolierter Lotabweichungen
Institut Fuer Angewandte Geodaesie, Frankfurt Am Main (West Germany).
S. Heitz. 1968, 43p REPT-109
Lang- in German, English and French Summaries
Seri- Its Ser. C- Dissertations, No. 124

Descriptors: *Geoids, *Gravimetry, *Interpolation, *Least squares method, Geodetic coordinates, Geodetic surveys, Triangulation, Vertical perception.

For abstract, see STAR 07 24.
N69-40531 HC$3.00 MF$0.65

AN ASTRONOMIC-GEODETIC GEOID DETERMINATION FOR WEST GERMANY.
Institut Fuer Angewandte Geodaesie, Frankfurt Am Main (West Germany).
For primary bibliographic entry see Field 8B.
For abstract, see STAR 07 24.
N69-40905 HC$3.00 MF$0.65

8F. Geography

USE OF AERIAL METHODS IN LANDSCAPE STUDIES,
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 8B.
AD-698 170 HC$3.00 MF$0.65

ECONOMIC GEOGRAPHY OF THE USSR: GEOGRAPHY OF HEAVY INDUSTRY,
Joint Publications Research Service, Washington, D.C.
A. D. Breiterman. 26 Nov 69, 336p
Trans. of mono. Ekonomicheskaya Geografiya SSSR: Geografiya Tyazheloi Promyshlennosti, Moscow, 1969 p50-452.

Descriptors: (*Economics, *USSR), (*Geography, *Industries), Industrial production, Population, Coal, Petroleum industry, Refineries, Metallurgy, Iron industry, Copper, Magnesium, Lead, Zinc, Aluminum, Nickel, Chemical industry, Machine tool industry, Tin.

Contents: Socialist distribution of the forces of production; General characteristics of the fuel-power economy; Coal industry; Petroleum and gas industry; Electrification; Ferrous metallurgy; Nonferrous metallurgy; Machine-building industry; Development and distribution of individual branches of Soviet machine building; Chemical industry.
JPRS-49321 HC$3.00 MF$0.65

8G. Geology and Mineralogy

THE EFFECT OF TWO-DIMENSIONAL TOPOGRAPHY ON SUPERFICIAL THERMAL GRADIENTS.
Technical rept.,
Geological Survey Washington D C
Arthur H. Lachenbruch. 1969, 101p Rept no. Bull-1203-E
Availability: Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $1.00.

Descriptors: (*Geophysics, Thermal analysis), Terrain models, Heat flux, Heat transfer, Ocean bottom, Measurement, Stability.
Identifiers: *Geothermy, *Geothermometry, Temperature gradients, Slopes, Jeffrey Bullard theory.

The Jeffreys-Bullard theory of the topographic disturbance to geothermal gradients is only approximate because it neglects the effects of lateral heat loss through sloping surfaces. It cannot be applied with confidence where the height of the relief features is large relative to their horizontal distance from the station and to the depth of the measurement points. In an important special case, the measurement depth is small relative to the distance to the relief, and the gradient anomaly can be approximated by the value applicable at zero depth. To investigate this case, an exact solution was obtained for the steady heat flux through an inclined plane of arbitrary height and slope angle. The effects of slopes of fairly general (two-dimensional)form can be approximated by identifying them with their equivalent plane slopes--the plane slopes which yield the same Jeffreys approximation at the station. The results are valid at points arbitrarily close to slopes of any height or inclination. (Author)
AD-698 156 MF$0.65

APOLLO 9 MULTISPECTRAL PHOTOGRAPHY - GEOLOGIC ANALYSIS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
For primary bibliographic entry see Field 14E.
For abstract, see STAR 07 24.
N69-40203 HC$3.00 MF$0.65

GEOLOGIC EVALUATION OF RADAR IMAGERY FROM DARIEN PROVINCE, PANAMA.
Kansas Univ., Lawrence. Engineering Science Div.
H. C. Mac Donald. 1969, 136p NASA-CR-101971, CRES-TR-133-6
Contracts NAS9-7175, DAAK02-68-C-0089

Descriptors: *Colombia, *Geology, *Imagery, *Panama, *Radar photography, Interpretation, Mapping, Side-looking radar, Tropical regions.

For abstract, see STAR 07 24.
N69-40572 HC$3.00 MF$0.65

THE KAOLIN DEPOSITS OF TIRSCHENRUTH AND THEIR GEOLOGICAL BACKGROUND COMPARED WITH THE WEIHERHAMMER DEPOSITS.
Die Kaolinlagerstaetten Von Tirschenreuth Und Ihr Geologischer Rahmen Im Vergleich Zu Den Lagerstaetten Von Weiherhammer
Technische Hochschule Munchen (West Germany).
O. Strobel. 1969, 32p
Lang- in German

Descriptors: *Geochronology, *Germany, *Kaolinite, *Sites, Clays, Earth planetary structure, Earth resources, Mineralogy, Petrology.

For abstract, see STAR 07 24.
N69-40878 HC$3.00 MF$0.65

MASS-SPECTROSCOPIC AND PREPARATIVE CONTRIBUTIONS ON THE CHEMISTRY OF THE METAL PI COMPLEXES.
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Allgemeine Wissenschaften.
For primary bibliographic entry see Field 8H.
For abstract, see STAR 07 24.
N69-40880 HC$3.00 MF$0.65

WATER SUPPLY POSSIBILITIES IN IRAN BASED ON EXISTING GEOLOGICAL AND CLIMATOLOGICAL CONDITIONS.
Technische Hochschule Munchen (West Germany). Fakultat Fuer Landwirtschaft Und Gartenbau.
For primary bibliographic entry see Field 8H.
For abstract, see STAR 07 24.
N69-40881 HC$3.00 MF$0.65

HYDRATION, OXIDATION, AND THE ORIGIN OF THE CALC-ALKALI SERIES.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
R. F. Mueller. Nov 69, 32p NASA-TN-D-5400
Contracts 188-45-01-01-51, NSF GA-307

Descriptors: *Hydration, *Igneous rocks, *Oxidation, *Petrology, Alkali metals, Calcium, Geochemistry.

For abstract, see STAR 07 24.
N69-40893 HC$3.00 MF$0.65

X-RAY FINE STRUCTURE STUDIES OF THE OXIDATION OF FERROSOFERRIC OXIDE TO GAMMA-FERRIC OXIDE AND ALPHA-FERRIC OXIDE, AND THE REDUCTION OF ALPHA-FERRIC OXIDE TO FERROSOFERRIC OXIDE, FERROUS OXIDE, AND IRON.
Roetgenfeinstrukturuntersuchung Der Oxidation Von Fe Sub 3 O Sub 4 Zu Gamma-fe Sub 2 O Sub 3, Und Alpha-fe Sub 2 O Sub 3, Und Der Reduktion Von Alpha-fe Sub 2 O Sub 3 Zu Fe Sub 3 O Sub 4, Feo Und Fe
Technische Hochschule Munchen (West Germany).
M. Alavi. 1969, 19p
Lang- in German

Descriptors: *Hematite, *Magnetite, *Oxidation, *Reduction (chemistry), *X ray analysis, Alpha decay, Fine structure, Phase transformations.

For abstract, see STAR 07 24.
N69-40904 HC$3.00 MF$0.65

THERMAL ANOMALIES AND GEOLOGIC FEATURES OF THE MONO LAKE AREA, CALIFORNIA, AS REVEALED BY INFRARED IMAGERY.
Geological Survey, Washington, D. C. National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
J. D. Friedman. Sep 68, 93p NASA-TM-X-61945, NASA-TL-82
NASA ORDER R-146-09-020-006
Prep- Prepared By the Geological Survey

Descriptors: *Abnormalities, *California, *Geology, *Infrared photography, *Thermodynamic properties, Earth surface, Physical properties, Solar flux, Surface temperature.

For abstract, see STAR 07 24.
N69-41239 HC$3.00 MF$0.65

THE GEOLOGY OF THE DUARINGA AND SAINT LAWRENCE 1 TO 250000 SHEET AREAS, QUEENSLAND.
Bureau of Mineral Resources, Geology and Geophysics, Canberra (Australia).
A. G. Kirkegaard, E. J. Malone, and F. Olgers.
1969, 181p REPT-121

Descriptors: *Australia, *Geodetic surveys, *Geomorphology, *Mapping, Aerial photography, Earth resources, Earth surface, Formations, Geological faults, Mining, Rocks.

For abstract, see STAR 07 24.
N69-41353 HC$3.00 MF$0.65

CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE): PROGRESS REPORT FOR APRIL 1 TO JUNE 30, 1969,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 8I.
For abstract, see NSA 23 23.
ORNL-TM-2689 HC$3.00 MF$0.65

MASS SPECTROGRAPHIC ANALYSIS OF MINERALS AND ROCKS (Massenspektrographische Analyse von Mineralen und Gesteinen),
Oak Ridge National Lab., Tenn.
H. Hintenberger. 1969, 20p
Trans. of die Naturwissenschaften (West Germany) v56 n5 p262-267 1969, by J. A. Carter.

Descriptors: (*Minerals, *Mass spectroscopy), (*Rock (Geology), Mass spectroscopy), Mass spectrum, Meteorites, Lead, Uranium, Iron alloys, West Germany.

For abstract, see NSA 23 23.
ORNL-tr-2220 HC$3.00 MF$0.65

NIOBIUM AND TANTALUM MINERAL DEPOSITS IN THE REPUBLIC OF SOUTH AFRICA,
Atomic Energy Board, Pelindaba, Pretoria (South Africa).
J. W. Von Backstrom, and L. T. Nel. Oct 68, 31p
PEL-177

Descriptors: (*Niobium, Deposits), (*Tantalum, Deposits), (*Ores (Metal sources), *Union of South Africa), Natural resources, Separation, Production, Heat-resistant metals+ alloys, Corrosion resistance, Flexural strength, Reactor materials, Ductility, Hardness, Chemical industry, Minerals, Pegmatite, Feldspar, Economic geology.

The purpose of this report is to give a general idea regarding the extent of the resources and production of niobium and tantalum ore minerals in the Republic of South Africa. (Author)
PB-187 994 HC$3.00 MF$0.65

HYDROTHERMAL SYNTHESIS OF CHRYSOBERYL (Hydrothermalsynthese von Chrysoberyll),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 20B.
PB-188 097T HC$3.00 MF$0.65

SLOPE STABILITY INVESTIGATION OF RESIDUAL CLAY SOILS OF SOUTHEASTERN OHIO.
Final rept.,
Ohio State Univ., Columbus. Engineering Experiment Station.
James R. Hooper. Oct 69, 5p EES-312
Prepared in cooperation with Ohio Dept. of Highways and Bureau of Public Roads, Washington, D.C.

Descriptors: (*Construction, Ohio), (*Clay, Foundations (Structures)), Stability, Terrain, Avalanches, Failure (Mechanics), Safety, Walls, Soils, Hardness, Samplers, Classification, Site selection, Underground, Stratigraphy, Moisture, Brittleness.
Identifiers: Retaining walls, Excavation, Landforms.

The primary purpose of the investigation is to show why the standard methods of stability analysis fail in application to clay soils in Southeastern Ohio, and to point out a proper approach. In addition, it is intended that field and laboratory techniques for investigating and testing the hard, stoney, brittle, water sensitive soils found on the slopes would be improved. (Author)
PB-188 185 HC$3.00 MF$0.65

PRESHOT GEOPHYSICAL STUDIES OF CABRIOLET NUCLEAR CRATER SITE,
California Univ., Livermore. Lawrence Radiation Lab.
L. D. Ramspott. Apr 68, 24p UCRL-50458
Prepared in cooperation with California Univ., Mercury, Nev. Lawrence Radiation Lab.

Descriptors: (*Nuclear explosions, Cratering), (*Rock (Geology), *Stratigraphy), Underground explosions, Well logging, Geological survey.
Identifiers: Cabriolet shot, Plowshare operation.

For abstract, see NSA 23 23.
PNE-953 HC$3.00 MF$0.65

REPORT OF EXPLORATION PROGRESS CENTRAL NEVADA, PERIOD JANUARY 1, 1968-APRIL 1, 1969.
Geological Survey, Denver, Colo.

Apr 69, 35p Central Nevada-30
Contract AT (29-2)-474

Descriptors: (*Rock (Geology), Nevada), Stratigraphy, Thermal analysis, Drilling.
Identifiers: *Geothermometry, Exploratory wells.

For abstract, see NSA 23 23.
USGS-474-18 HC$3.00 MF$0.65

SOME PHYSICAL PROPERTIES OF ROCKS IN DRILL HOLE UAe-3, AMCHITKA ISLAND, ALASKA.
Geological Survey, Denver, Colo.
William H. Lee. Apr 69, 12p USGA-Amchitka-8-2

Descriptors: (*Rock (Geology), *Stratigraphy), Well logging, Physical properties, Alaska.
Identifiers: Amchitka (Aleutian islands).

For abstract, see NSA 23 23.
USGS-474-6 HC$3.00 MF$0.65

8H. Hydrology and Limnology

THE RUNOFF COEFFICIENT AND ITS DEPENDENCE ON THE DURATION OF A RAIN.
Der Abflussbeiwert Und Seine Abhaengigkeit Von Der Regendauer
Technische Hochschule Munchen (West Germany).
R. Pecher. 1969, 194p
Lang- in German

Descriptors: *Drainage, *Mathematical models, *Rain, *Water flow, Channel capacity, Channel flow, Hydrology, Systems engineering.

For abstract, see STAR 07 24.
N69-40879 HC$3.00 MF$0.65

MASS-SPECTROSCOPIC AND PREPARATIVE CONTRIBUTIONS ON THE CHEMISTRY OF THE METAL PI COMPLEXES.
Massenspektroskopische Und Praeparative Beitraege Zur Chemie Der Metall-pi-komplexe
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Allgemeine Wissenschaften.
P. Goeser. 1969, 63p
Lang- in German

Descriptors: *Chemical bonds, *Ligands, *Organometallic compounds, *Transition metals, Chemical analysis, Chemical reactions, Energy of formation, Mass spectroscopy, Nuclear binding energy.

For abstract, see STAR 07 24.
N69-40880 HC$3.00 MF$0.65

WATER SUPPLY POSSIBILITIES IN IRAN BASED ON EXISTING GEOLOGICAL AND CLIMATOLOGICAL CONDITIONS.
Moglichkeit Der Wasserversorgung Im Kaiserreich Iran Auf Grund Der Bestehenden Geologischen Und Klimatischen Verhaltnisse
Technische Hochschule Munchen (West Germany). Fakultat Fuer Landwirtschaft Und Gartenbau.
S. E. Khessal. 1969, 21p
Lang- in German

Descriptors: *Conservation, *Hydrogeology, *Iran, *Water balance, *Water reclamation, Bioclimatology, Ecology, Sea water, Underground storage, Water consumption.

For abstract, see STAR 07 24.
N69-40881 HC$3.00 MF$0.65

STOCHASTIC MODELS FOR BIOCHEMICAL OXYGEN DEMAND AND DISSOLVED OXYGEN IN ESTUARIES,
Virginia Polytechnic Inst., Blacksburg. Water Resources Research Center.
Stephen W. Custer, and Richard G. Krutchkoff.
Feb 69, 249p* Bull-22 W70-01774, FWPCA-16090-02/69

Descriptors: (*Water pollution, Mathematical models), (*Estuaries, Oxygen), Potomac River, Stochastic processes, Statistical distributions, Differential equations, Numerical analysis, Computer programs, Diffusion.
Identifiers: Biochemical oxygen demand, Dissolved oxygen, Dissolved gases.

Two distinct stochastic models, the Non-Dispersion Model and the Diffusion Model were developed for determining the biochemical oxygen demand (BOD) and dissolved oxygen (DO) probability distribution in an estuary. The mean BOD and DO concentrations were functions of time and space, hence the probability distributions were also temporally and spatially dependent. A computer program was employed to summarize the results in a concise form so that it could be used in the overall decision process. Information for a given point in space was obtained five miles downstream from the source. The mean BOD and DO levels were obtained for each increment of the tidal cycle. The frequency of the concentration above each critical value was obtained. A comparison of the numerical results revealed that the traumatic peaks observed for the non-dispersion model were obliterated in the diffusion model. In the light of the numerical results it concluded that the non-diffusion model was inadequate for describing the estuary situation. The diffusion model was verified on water quality survey data for the Potomac estuary. (Author)
PB-188 094 HC$3.00 MF$0.65

GENERALIZED INITIAL CONDITIONS FOR THE STOCHASTIC MODEL FOR POLLUTION AND DISSOLVED OXYGEN IN STREAMS.
Virginia Polytechnic Inst., Blacksburg. Water Resources Research Center.
Richard H. Moushegian, and Richard G. Krutchkoff. Aug 69, 93p* Bull-28 W70-01775, FWPCA-16090-08/69

Descriptors: (*Water pollution, Mathematical models), (*Rivers, Oxygen), Initial value problems, Probability density functions, Statistical distributions, Stochastic processes, Mathematical prediction, Computer programs.
Identifiers: Biochemical oxygen demand, Dissolved oxygen, Dissolved gases.

A stochastic model was developed and used to predict the biochemical oxygen demand (BOD) and dissloved oxygen (DO) concentrations at several points downstream of a waste discharge. The model used provided a joint density function for both pollution and and dissolved oxygen with given initial conditions. The initial conditions were generalized to permit the output for one stream segment to be the initial conditions for the succeeding stream segment. Interest was focused on the measurement of the marginal distribution of BOD and DO along a stream stretch whose parameters may change at known locations. A computer program assisted in the calculations to obtain marginal distributions. The program allowed for changes in parameter values between one stream segment and the next and could predict distributions for any intermediate locations along the river. The application of this study lay in the analysis of an entire stream stretch to determine if it was healthy for the users within certain preset probabilistic standards. (Author)
PB-188 095 HC$3.00 MF$0.65

A MODEL FOR QUANTIFYING FLOW AUGMENTATION BENEFITS.
Final rept.,
Florida Univ., Gainesville. Dept. of Environmental Engineering.
E. E. Pyatt, J. P. Heaney, G. R. Grantham, and B. J. Carter. Sep 69, 546p W70-02039
Grant FWPCA-16090-DRM

Descriptors: (*Rivers, *Water pollution), Cost effectiveness, Mathematical models, Linear programming, Sewage, Costs, Computer programs.
Identifiers: *Flow augmentation, River regulation.

With increasing quantitative and qualitative demands being placed upon national water resources, improved management practices are vitally needed. In principle, one powerful management tool is systems analysis, wherein mathematical optimizing techniques are employed to effect rational tradeoffs between competing demands for water use, but this tool, in turn, rests upon the availability of methodologies for quantifying the benefits (economic value) of each water-use category. That is, systems analysis, before it can be employed comprehensively, demands a knowledge of the functional value of irrigation, flood control, municipal water supply, etc. Little is known of the economic implications of low flow augmentation, one of the important water-use categories. Beginning with the premise that the value of low flow augmentation is measured by sewage treatment costs avoided, a hydrologic flow simulator and a water quality linear programming model were interfaced to develop a procedure for determining 'willingness to pay' for augmentation. This generalized approach can be applied by others to their specific water pollution control situations. (Author)
PB-188 208 HC$3.00 MF$0.65

RECORDS OF SELECTED WELLS AND SPRINGS IN THE RULISON PROJECT AREA, GARFIELD AND MESA COUNTIES, COLORADO,
Geological Survey, Denver, Colo.
R. Theordore Hurr, Woodrow W. Wilson, Frank A. Welder, and R. L. Emerson. Sep 69, 17p PNE-R-6

Descriptors: (*Nuclear industrial applications, Underground explosions), (*Water supplies, Mapping), Water wells, Hydrology, Colorado.
Identifiers: Rulison shot.

For abstract, see NSA 23 23.
USGS-474-40 HC$3.00 MF$0.65

8I. Mining Engineering

CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE): PROGRESS REPORT FOR APRIL 1 TO JUNE 30, 1969,
Oak Ridge National Lab., Tenn.
W. D. Arnold, and D. J. Crouse. 25 Aug 69, 16p
See also Progress rept. Jan-Mar 69, ORNL-TM-2567.

Descriptors: (*Mining engineering, *Nuclear explosions), (*Petroleum industry, Nuclear explosions), Copper, Ruthenium, Chemical contamination, Shale, Gases, Gas analysis.
Identifiers: Plowshare operation, *Copper ores, Leaching, *Shale oil, *Natural gas.

For abstract, see NSA 23 23.
ORNL-TM-2689 HC$3.00 MF$0.65

8J. Physical Oceanography

INFLUENCE OF THE ATLANTIC WATERS ON CERTAIN FEATURES OF THE HYDROLOGICAL REGIME OF THE ARCTIC BASIN AND ITS CONTIGUOUS SEAS,
Defence Scientific Information Service Ottawa (Ontario)
For primary bibliographic entry see Field 8C.
AD-697 890 HC$3.00 MF$0.65

FOAM SEPARATION AS A TOOL IN CHEMICAL OCEANOGRAPHY.
Final rept.,
Naval Research Lab Washington D C
G. T. Wallace, Jr., and D. F. Wilson. 6 Nov 69, 22p* Rept no. NRL-6958

Descriptors: (*Sea water, *Foams), (*Proteins, Sea water), Separation, Surface-active substances, Oceanology.
Identifiers: *Frothing, *Concentrating.

A simple batch-type, foam-separation apparatus is described which has produced a 200-fold concentration of added protein from artificial seawater. Essentially total recovery of the protein was achieved from initial concentrations as low as 5 micro g/l. The method is rapid and simple in operation and is proposed for use in concentrating surface-active compounds from seawater. (Author)
AD-697 924 HC$3.00 MF$0.65

MONTHLY CHARTS OF MEAN, MINIMUM, AND MAXIMUM SEA SURFACE TEMPERATURE OF THE NORTH PACIFIC OCEAN.
Special publication,
Naval Oceanographic Office Washington D C
Paul E. LaViolette, and Sandra E. Seim. 1969, 109p* Rept no. NOO-SP-123
Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Pacific Ocean, *Surface temperatures), Thermal properties, Sea ice, California, Seacoast, Bering Sea, Okhotsk Sea.
Identifiers: Air water interactions, Upwelling, Isotherms, Graphs (Charts).

The charts, based on ship injection temperature data, show the monthly mean, minimum, and maximum sea surface temperatures for the Pacific Ocean from 20 degrees S. (except east of 170 degrees W. where temperatures begin at 10 degrees S.) to 66 degrees N. The data are numerous in all but the equatorial portion of the area, and during the winter in the Bering Sea and Sea of Okhotsk. Upwelling along the coast of the continents is also evident from the charts. The cold waters indicative of such action are graphically displayed along the coasts of California and South America. Because of the large quantity of data involved, these charts, in general, are more definitive than charts of other parameters such as salinity, except where the analysis was based on fewer than 10 observations per 10 degrees quadrangle or in regions where averaging disguises more complex thermal structure. (Author)
AD-698 125 HC$3.00 MF$0.65

THE EFFECT OF TWO-DIMENSIONAL TOPOGRAPHY ON SUPERFICIAL THERMAL GRADIENTS.
Geological Survey Washington D C
For primary bibliographic entry see Field 8G.
AD-698 156 MF$0.65

VERIFICATION OF MAZEIKA'S METHOD OF THERMOCLINE DEPTH PREDICTION FOR THE NORTHEAST PACIFIC OCEAN.
Masters' Thesis,
Naval Postgraduate School, Monterey, Calif.
John William Ciboci. Oct 66, 65p
Distribution Limitation now Removed.

Descriptors: (*Pacific Ocean, Thermoclines), (*Thermoclines, Mathematical prediction), Depth finding, Marine meteorology, Weather stations, Surface temperatures, Wind, Ocean waves, Salinity, Bathythermograph data, Theses.
Identifiers: Mazeika method.

Mazeika's method for forecasting mixed-layer (thermocline) depth of the upper ocean layers is discussed along with a newer version of this method developed by James. Using Mazeika's method primarily, a verification for the Northeast Pacific Ocean was completed with data from Ocean Weather Stations PAPA (50N, 145W) and NOVEMBER (30N, 140W) and a point named MIDPOINT (40N, 140W). Climatology data which can be used to obtain surface and 400-foot level temperature are also tested. The results indicate these data are very useful and accurate in determining the stability index required of Mazeika's method. (Author)

AD-803 657 HC$3.00 MF$0.65

8K. Seismology

SEISMICITY OF WESTERN AUSTRALIA.
Bureau of Mineral Resources, Geology and Geophysics, Canberra (Australia). Geophysical Branch.
I. B. Everingham. 1968, 61p REPT-132

Descriptors: *Australia, *Geomorphology, *Gravitational effects, *Seismology, Earthquakes, Geological faults, Precambrian period, Shock waves.

For abstract, see STAR 07 24.
N69-40394 HC$3.00 MF$0.65

STABILITY OF COLUMNS SUBJECTED TO A RANDOM AXIAL LOAD.
Technical rept.,
New Mexico Univ., Albuquerque. Bureau of Engineering Research.
Paul H. Wirsching, and James T. P. Yao. Nov 69, 31p CE-20 (69)NSF-065
Grant NSF-GK-2727, NSF-GK-2865

Descriptors: (*Earthquakes, Simulation), (*Launch vehicles (Aerospace), Beams (Structural)), (*Beams (Structural), Stability), Deformation, Buckling (Mechanics), Seismic waves, White noise, Differential equations, Excitation, Damping, Reaction kinetics.
Identifiers: Saturn launch vehicles, Computerized simulation, Computer analysis.

Using an analog computer for simulations, an empirical relationship is developed for the stability condition of a pin-ended column, which is excited by a 'physical' white noise. This relationship is then applied in two practical examples. In the first example, the column stability of a typical building subjected to earthquake loads is considered. The results of this example suggest that dynamic instability caused by earthquake excitation is not likely to be a problem in structures designed according to the current AISC specifications. In the second example, a hypothetic column for a spacecraft structure is subjected to the Saturn V random vibration design environment. In this example, it is found that under certain conditions dynamic instability may be a problem. (Author)
PB-188 192 HC$3.00 MF$0.65

RESPONSE OF BILINEAR HARDENING SYSTEMS TO EARTHQUAKE-LIKE EXCITATION.
Technical rept.,
New Mexico Univ., Albuquerque. Bureau of Engineering Research.
Paul H. Wirsching, and James T. P. Yao. Nov 69, 76p CE-19 (69)NSF-065
Grant NSF-GK-2727, NSF-GK-2865

Descriptors: (*Earthquakes, Simulation), (*Structures, Response), Deformation, Failure (Mechanics), Seismic waves, Velocity, Damping, Least squares method, Curve fitting, Distribution functions, Reaction kinetics, White noise, Probability.
Identifiers: Computerized simulation, Computer analysis, Single degree of freedom.

The objective of this study is to study the behavior of bilinear hardening systems subjected to random seismic excitation. First, the lateral ground motion of earthquakes is simulated with the use of a random signal generator and an analog computer. The motion simulated is non-stationary as it is with earthquakes. Moreover, the statistical characteristics of the analog simulation seem to agree well with those of strong-motion earthquakes which have been recorded and analyzed to-date. Then, the bilinear structural system is simulated on another analog computer. Sample functions are generated. Data are analyzed statistically with the aid of a digital computer. These results seem to indicate that the 'non-linear effect' is not particularly effective in reducing the maximum response of the system. (Author)
PB-188 193 HC$3.00 MF$0.65

8L. Snow, Ice, and Permafrost

CHEMICAL CONCENTRATIONS OF POLLUTANT LEAD AEROSOLS, TERRESTRIAL DUSTS, AND SEA SALTS IN GREENLAND AND ANTARCTIC snow strata,
Scripps Institution of Oceanography La Jolla Calif
Tsaihwa J. Chow, C. Patterson, and M. Murozumi. 1969, 110p
Contract Nonr-2216 (23)
Prepared in cooperation with California Inst. of Tech., Pasadena. Div. of Geological Sciences, Contract AT (04-3)-427. Rept. no. CALT-427-30 and Muroran Inst. of Tech., Hokkaido (Japan).

Descriptors: (*Air pollution, Aerosols), (*Lead compounds, *Snow), (*Dust, Snow), (*Salts, Snow), Antarctic regions, Greenland, Soils, Ice, Concentration (Chemistry), Sea water, Sodium compounds, Chlorides, Magnesium compounds, Calcium compounds, Potassium compounds, Silicates, Seacoast.

The report describes results of an analyses of lead in annual ice layers from the interior of northern Greenland and in annual layers of ice from the interior of the Antarctic continent. The observations of the chemical concentrations of the common elements in ice from the interior of Greenland and Antarctica can be explained in terms of simple relations among sea salts and terrestrial dusts. About ten times more dust was found in Greenland interior ice than in Antarctic interior ice, but twice as much sea salt was found in Antarctic interior ice than in Greenland interior ice.
AD-697 964 HC$3.00 MF$0.65

DEVELOPMENT AND EVALUATION OF AN APPARATUS FOR THE DIRECT TENSILE TESTING OF ICE.
Cold Regions Research and Engineering Lab Hanover N H
For primary bibliographic entry see Field 14B.
AD-698 022 HC$3.00 MF$0.65

SNOW ALBEDO MODIFICATION: A REVIEW OF LITERATURE.
Final rept.,
Cold Regions Research and Engineering Lab Hanover N H
Charles W. Slaughter. Oct 69, 31p Rept no. CRREL-TR-217

Descriptors: (*Snow, Albedo), Brightness, Ice, Surface properties, Reflectivity, Melting, Absorption, Agriculture, Sand, Particle size.
Identifiers: Snow albedo modification.

A summary of published information on snow albedo modification is presented. Consideration of energy balance parameters is followed by discussion of qualitative and quantitative results of albedo modification, both increasing (lightening) and decreasing (darkening). Practical applications of albedo modification are discussed. (Author)
AD-698 023 HC$3.00 MF$0.65

CALCULATION OF GLAZE WIND LOADS UPON HIGH INSTALLATIONS,
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 13M.
AD-698 172 HC$3.00 MF$0.65

USE OF NIMBUS 2 APT TO DETERMINE THE RATE OF ICE DISINTEGRATION AND DISPERSION IN HUDSON BAY.
Allied Research Associates, Inc., Concord, Mass.
C. J. Bowley. Mar 69, 43p NASA-CR-106478, REPT-9G45-31
Contract NAS5-10343

Descriptors: *Automatic picture transmission, *Canada, *Ice formation, *Ice reporting, *Nimbus 2 satellite, *Spaceborne photography, Clouds (meteorology), Disintegration, Earth resources program, Pattern recognition, Photointerpretation, Temperature, Wind (meteorology).

For abstract, see STAR 07 24.
N69-41162 HC$3.00 MF$0.65

8M. Soil Mechanics

THE STRENGTH AND CREEP OF FROZEN SOILS AND CALCULATIONS FOR ICE-SOIL RETAINING STRUCTURES,
Cold Regions Research and Engineering Lab., Hanover, N.H.
S. S. Vyalov, V. G. Gmoshinskii, S. E. Gorodetskii, V. G. Grigorieva, and Yu. K. Zaretskii. Sep 65, 324p CRREL-Trans-76
Trans. of mono. Prochnosti Polzuchest Merzlykh Gruntov i Raschety Ledogruntovykh Ograzhdenii, Moscow, 1962. Distribution Limitation now Removed.

Descriptors: (*Soils, Freezing), (*Construction materials, Soils), (*Soil mechanics, Structural properties), Foundations (Structures), Mining engineering, Walls, Rheology, Deformation, Stresses, Mechanical properties, Creep, Test methods, Failure (Mechanics), Moisture, Ice, Particle size, Cylindrical bodies, USSR.
Identifiers: *Frozen soils, Soil texture, Frost, Artificially frozen soils.

Since frozen soils are relatively strong and watertight, they may be used sucessfully as materials for various types of engineering construction. For example, artificially frozen soils may be used as retaining structures during mining and under complex hydrogeological conditions for sinking openshafts. When plans and static calculations are being made for constructions on frozen soils, it is necessary to take into consideration the specific properties of such soils. The strength and deformation properties of frozen soils depend essentially upon soil-temperature, soil-composition, and soil-texture (grain-size distribution, moisture content, ice content, frost texture, etc.). Furthermore, the stress-deformation characteristics of frozen soils depend to a very large degree upon the time factor. Since ice and unfrozen water are present, the soils possess clearly defined rheological properties, such as increasing deformation with time (creep), and relaxation and reduction of strength. This book is devoted to the study of the rheological properties of frozen soils and to the development of methods for calculating creep and long-term strength of retaining structures made from artificially frozen soils. (Author)
AD-484 093 HC$3.00 MF$0.65

PLANE STRAIN CONSOLIDATION BY FINITE ELEMENTS.
Research rept.,
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
Jan Willem Boehmer, and John T. Christian. Aug 69, 183p R69-60, Soil Mechanics Pub-243
Contract DOT-C-85-65

Descriptors: (*Soil mechanics, *Strain (Mechanics)), Foundations (Structures), Loading (Mechanics), Deformation, Stresses, Drainage, Computer programs.
Identifiers: Consolidation, High speed ground transportation.

The report describes the application of the finite element technique to plane strain consolidation problems, dealing with primary consolidation only. A description is given of three-dimensional consolidation in order to explain three-dimensional effects in the consolidation process and to discuss similarities in the finite element formulation, Biot's and Terzaghi's formulation. The main points of a

finite element formulation for the consolidation process are summarized, and the resulting computer program, CONSOL, is described. The complete element formulation is given in an appendix. An investigation is made on one- and two-dimensional problems, which show the effects discussed in the chapter on consolidation theory. A choice is made of problems which are of practical importance. (Author)
PB-188 023 HC$3.00 MF$0.65

THE USE OF INSTRUMENTED PENETROMETERS TO DETERMINE SUBSOIL CONDITIONS AT INACCESSIBLE SITES.
Development rept.,
Sandia Labs., Albuquerque, N. Mex.
John L. Colp. Oct 69, 42p* SC-DR-69-573

Descriptors: (*Terminal flight facilities, Site selection), (*Soil mechanics, Test equipment), Feasibility studies, Projectiles, Air drop operations, Penetration, Soils, Design, Trajectories, Deceleration, Engineering geology, Instrumentation, Telemeter systems, Experimental data, Analysis, Performance (Engineering), Stratigraphy.
Identifiers: *Terradynamics, *Terraballistic projectiles, Penetration resistance, Subsurface investigations, Inaccessible sites.

A remote sensing study demonstrates that an air-dropped instrumented penetrometer can produce reliable information on subsoil conditions at a location inaccessible by direct means, and that sufficient experience now exists to analyze this information repeatably. (Author)
PB-188 139 HC$3.00 MF$0.65

SLOPE STABILITY INVESTIGATION OF RESIDUAL CLAY SOILS OF SOUTHEASTERN OHIO.
Final rept.,
Ohio State Univ., Columbus. Engineering Experiment Station.
James R. Hooper. Jul 69, 105p EES-312-2
See also PB-188 185.

Descriptors: (*Avalanches, *Soil mechanics), (*Clay, Stability), Structural geology, Engineering geology, Creep, Stratigraphy, Clay minerals, Density, Classification, Shear stresses, Test methods, Civil engineering, Ohio.
Identifiers: *Slopes, Geomorphology, Residual soils, Shales, Soil water, Soil pressure, Swelling, Slickenside surfaces.

The study was a slope stability investigation of the residual clay slopes on Conemaugh Formation clay-shales in Southeastern Ohio. Active creep landforms on natural slopes were sectioned by vertical-walled trenches and undisturbed samples taken of the in-situ slide planes controlling the movements. Laboratory direct shear tests of the slide planes showed that the strength properties were those of a soil at its residual shear strength. Slope stability analysis verified that the shear plane was the boundary of the landform, and pointed out that use of the more standard shear strength parameters would cause gross error, and could be a dangerous design practice. Photographs describing the nature of the slide planes are given and some details of stratigraphic relationships within the landforms presented. Other properties that were measured in the study included the engineering classifications, soil density, water content, etc., and mineralogical and swelling potential characteristics. Possible relationships between the mineralogy, the swelling phenomena and the in-situ shear planes are qualitatively examined. (Author)
PB-188 191 HC$3.00 MF$0.65

A DEFINITION OF ORGANIC SOILS. AN ENGINEERING IDENTIFICATION,
Louisiana State Univ., Baton Rouge, Division of Engineering Research.
For primary bibliographic entry see Field 13B.
PB-188 195 HC$3.00 MF$0.65

8N. Terrestrial Magnetism

ANOMALIES OF GEOMAGNETIC VARIATIONS OBSERVED AT MADDALENA ISLAND, SARDINIA, AND THEIR PROBABLE CAUSES.
Centro Nazionale Di Fisica Dell Atmosfera E Meteorologia, Rome (Italy).
M. Giorgi, and I. Yokoyama. 1968, 21p CENFAM-PV-33
Date- 1968 Coll- 21 P Refs Seri- Quaderni de La Ric. Sci. No. 44

Descriptors: *Geomagnetism, *Italy, *Magnetic variations, Coasts, Diurnal variations, Islands, Magnetic fields, Magnetic signatures, Mediterranean sea, Vertical distribution.

For abstract, see STAR 07 24.
N69-40237 HC$3.00 MF$0.65

NASA SPACE VEHICLE DESIGN CRITERIA-ENVIRONMENT. MAGNETIC FIELDS - EARTH AND TERRESTRIAL.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 07 24.
N69-40269 HC$3.00 MF$0.65

ON THE DEFINITION OF THE GEOMAGNETIC L COORDINATE.
Rome Univ. (Italy). Inst. of Physics.
G. Pizzella, and C. Signorini. 17 Jun 69, 8p
Seri- Its Nota Interna 226

Descriptors: *Coordinates, *Geomagnetism, *Independent variables, Lines of force, Magnetic fields, Magnetically trapped particles, Particle flux density.

For abstract, see STAR 07 24.
N69-40729 HC$3.00 MF$0.65

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

LOW-POWER TYPE 6X6C ELECTRON TUBES FOR WIDELY EMPLOYED DEVICES.
Army Foreign Science and Technology Center Washington D C
17 Nov 69, 11p Rept no. FSTC-HT-23-774-68
Trans. of Russian State Standard GOST-8080-67.

Descriptors: (*Diodes (Electron tubes), Standards), Demodulators, USSR.
Identifiers: Translations.

The document establishes standards for the physical configuration and electrical characteristics of the Type 6X6C duo-diode electron tube. A detailed chart outlines testing standards and conditions, including maximum and minimum specifications for both testing and operating conditions. (Author)
AD-697 984 HC$3.00 MF$0.65

TYPE 5Ts4C LOW-POWERED ELECTRON TUBE FOR WIDELY USED DEVICES.
Army Foreign Science and Technology Center Washington D C

10 Nov 69, 13p Rept no. FSTC-HT-23-304-69
Trans. of Russian State Standard GOST 8079-67.

Descriptors: (*Electron tubes, Rectifiers), Standards, USSR.
Identifiers: Translations.

The document establishes standards for the physical configuration and electrical characteristics of the type 5Ts4C dual-plate vacuum rectifier tube. A detailed chart outlines testing standards and conditions including maximum and minimum specifications for tube electrical parameters. (Author)
AD-698 163 HC$3.00 MF$0.65

LOW-POWER ELECTRONIC TUBES TYPE 30TS6S FOR A BROAD RANGE OF APPLICATIONS.
Army Foreign Science and Technology Center Washington D C

10 Nov 69, 12p Rept no. FSTC-HT-23-303-69
Trans. of Russian State Standard GOST 8078-67 21 Oct 67.

Descriptors: (*Electron tubes, Standards), Reliability (Electronics), Specifications, USSR.
Identifiers: Translations.

The article outlines specifications for testing low-power electronic tubes of type 30Ts6S. Testing specifications for vibration, heat-stability, humidity-stability are included. Tests for short circuiting, breakdown, and guaranty of durability are shown as well. There are details of requirements for testing under various heat conditions. More details of vibration testing are also included. (Author)
AD-698 165 HC$3.00 MF$0.65

MAGNETOELASTIC LOVE WAVES.
Sperry Rand Research Center Sudbury Mass
For primary bibliographic entry see Field 20C.
AD-698 193 HC$3.00 MF$0.65

INVESTIGATION OF THE GUNN EFFECT IN GALLIUM ARSENIDE.
Naval Postgraduate School, Monterey, Calif.
For primary bibliographic entry see Field 20L.
AD-800 479 HC$3.00 MF$0.65

PHOTOCONDUCTOR-SEMICONDUCTOR EMITTERS.
Stanford Research Inst., Menlo Park, Calif.
For primary bibliographic entry see Field 20L.
AD-809 036 HC$3.00 MF$0.65

RESEARCH ON METALLURGICAL CHARACTERISTICS AND PERFORMANCE OF MATERIALS USED FOR SLIDING ELECTRICAL CONTACTS SUMMARY REPORT, 1 MAY 1968 - 30 APR. 1969.
Battelle Memorial Inst., Columbus, Ohio.
W. H. Abbott, and E. S. Bartlett. Oct 69, 61p
NASA-CR-1447
Contract NAS12-657
Coll- 61 P Refs

Descriptors: *Contact resistance, *Electrical resistivity, *Gold alloys, *Gold coatings, Electroplating, Friction factor, Physical properties, Static friction, Wear tests.

For abstract, see STAR 07 24.
N69-40057 HC$3.00 MF$0.65

INVESTIGATION OF NEW CONCEPTS OF ADAPTIVE DEVICES QUARTERLY TECHNICAL REPORT, 3 DEC. 1968 - 2 MAR. 1969.
Sperry Rand Research Center, Sudbury, Mass.
E. Lewis, F. Sewell, and H. A. Wegener. Apr 69, 29p NASA-CR-86254, SRRC-CR-69-7
Contract NAS12-570

Descriptors: *Computer storage devices, *Electronic equipment, *Semiconductor devices, Graphs (charts), Insulation, Quantitative analysis.

For abstract, see STAR 07 24.
N69-40066 HC$3.00 MF$0.65

INVESTIGATION OF NEW CONCEPTS OF ADAPTIVE DEVICES QUARTERLY TECHNICAL REPORT, 15 SEP. - 14 DEC. 1967.
Sperry Rand Research Center, Sudbury, Mass.
E. T. Lewis, F. A. Sewell, Jr., and H. A. Wegener.
Jan 68, 26p NASA-CR-86250, SRRC-CR-68-8
Contract NAS12-570

Descriptors: *Barrier layers, *Energy storage, *Semiconductor devices, *Silicon transistors, Charge distribution, Computer storage devices, Electrical properties, Performance tests, Silicon nitrides.

For abstract, see STAR 07 24.
N69-40201 HC$3.00 MF$0.65

INVESTIGATION OF NEW CONCEPTS OF ADAPTIVE DEVICES QUARTERLY TECHNICAL REPORT, 15 SEP. - 14 DEC. 1968.
Sperry Rand Research Center, Sudbury, Mass.
E. Lewis, and H. A. Wegener. 14 Dec 68, 11p
NASA-CR-86253, SRRC-CR-68-51
Contract NAS12-570

Descriptors: *Charge distribution, *Light (visible radiation), *Semiconductor devices, *Silicon nitrides, *Temperature effects, Capacitance, Charge transfer.

For abstract, see STAR 07 24.
N69-40271 HC$3.00 MF$0.65

INVESTIGATION OF NEW CONCEPTS OF ADAPTIVE DEVICES QUARTERLY TECHNICAL REPORT, 15 DEC. 1967 - 14 MAR. 1968.
Sperry Rand Research Center, Sudbury, Mass.
M. Cohn, M. Doig, E. Lewis, A. Lincoln, and F. Sewell. Apr 68, 22p NASA-CR-86251, SRRC-CR-68-20
Contract NAS12-570

Descriptors: *Capacitors, *Electric energy storage, *Logic circuits, *Metal oxide semiconductors, Learning machines, Transistor logic, Transistors.

For abstract, see STAR 07 24.
N69-40361 HC$3.00 MF$0.65

NONLINEAR MICROWAVE TUBE PHYSICS FINAL REPORT.
Chalmers Univ. of Technology, Goteborg (Sweden). Research Lab. of Electronics.
S. Olving. Dec 68, 16p AD-691082, RADC-TR-69-89
Contract AF 61/052/-890

Descriptors: *Microwave equipment, *Nonlinear systems, *Traveling wave tubes, Ferromagnetic materials, Klystrons, Phase shift, Space charge.

For abstract, see STAR 07 24.
N69-40382 HC$3.00 MF$0.65

INVESTIGATION OF NEW CONCEPTS OF ADAPTIVE DEVICES QUARTERLY TECHNICAL REPORT, 15 JUN. - 14 SEP. 1967.
Sperry Rand Research Center, Sudbury, Mass.
A. J. Lincoln, H. C. Pao, and H. A. Wegener. Dec 67, 50p NASA-CR-86249, SRRC-CR-67-62
Contract NAS12-570

Descriptors: *Adaptive control, *Field effect transistors, *Memory, *Threshold gates, Current distribution, Inverters, Switching circuits.

For abstract, see STAR 07 24.
N69-40402 HC$3.00 MF$0.65

AN INVESTIGATION OF THE TRIMMING OF NICKEL CHROMIUM FILM RESISTORS BY DIAMOND TIP ULTRASONIC SCRIBING.
Signals Research and Development Establishment, Christchurch (England).
S. K. Archer. Nov 68, 13p AD-691704, SRDE-69003

Descriptors: *Diamonds, *Resistors, *Thin films, *Ultrasonic machining, Chromium, Lasers, Nickel, Scoring, Spark machining.

For abstract, see STAR 07 24.
N69-40417 HC$3.00 MF$0.65

INVESTIGATION OF NEW CONCEPTS OF ADAPTIVE DEVICES QUARTERLY TECHNICAL REPORT, 3 MAR. - 2 JUN. 1969.
Sperry Rand Research Center, Sudbury, Mass.
E. Lewis, F. Sewell, and H. A. Wegener. Jun 69, 19p NASA-CR-86255, SRRC-CR-69-16
Contract NAS12-570

Descriptors: *Capacitors, *Charge distribution, *Electric energy storage, *Logical elements, *Metal oxide semiconductors, *Photosensitivity, Charge transfer, Current distribution, Polarization (charge separation).

For abstract, see STAR 07 24.
N69-40438 HC$3.00 MF$0.65

RESEARCH ON LOW VOLTAGE ELECTROLUMINESCENT DEVICES WITH STORAGE, PHASE 2 FINAL TECHNICAL REPORT.
Marquardt Corp., Van Nuys, Calif.
J. M. Hanlet. Mar 69, 57p NASA-CR-86259, REPT-25284
Contract NAS12-545

Descriptors: *Crystallinity, *Electroluminescence, *P-n junctions, Deposition, Room temperature, Zinc selenides, Zinc tellurides.

For abstract, see STAR 07 24.
N69-40457 HC$3.00 MF$0.65

ELECTROLYTIC CAPACITOR TESTS - LIFE AND NONDESTRUCTIVE TESTS FOR LOW AND HIGH VOLTAGE TYPES.
Undersogelse Af Al-elektrolytkondensatorer. Levetidsprover Og Ikke-destruktive Prover for Et Antal Fabrikater Af Hoj-og Lavvolttyper
Danish Research Centre for Applied Electronics, Copenhagen.
A. Norballe, and S. T. Olesen. Dec 68, 47p ECR-04
Lang- in Danish, English Summary

Descriptors: *Capacitors, *Life (durability), *Nondestructive tests, Aluminum, Electrolytes, Electronic equipment tests, Experimental design, Quality control.

For abstract, see STAR 07 24.
N69-40509 HC$3.00 MF$0.65

CROSS MODULATION IN TRAVELING WAVE TUBES.
Chalmers Univ. of Technology, Goteborg (Sweden). Research Lab. of Electronics.
J. I. Lindstrom, and O. Nilsson. 1 Nov 68, 42p AD-691015, RADC-TR-69-182
Contract AF 61/052/-890

Descriptors: *Modulation, *Superhigh frequencies, *Traveling wave tubes, *Ultrahigh frequencies, Crossed field amplifiers, Nonlinear systems.

For abstract, see STAR 07 24.
N69-40583 HC$3.00 MF$0.65

THE IMPULSE BREAKDOWN IN INSULATING OIL.
Der Stossdurchschlag in Isolieroel
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Maschinenwesen Und Elektrotechnik.
M. G. Kratzenstein. 1969, 199p
Lang- in German

Descriptors: *Electric discharges, *Electrical faults, *Electrical insulation, *High voltages, *Mineral oils, Electric field strength, Electrodes, Voltage generators.

For abstract, see STAR 07 24.
N69-40758 HC$3.00 MF$0.65

ENERGY DISTRIBUTION OF A SPIRALING ELECTRON BEAM.
National Aeronautics and Space Administration. Electronics Research Center, Cambridge, Mass.
B. Kulke. Nov 69, 25p NASA-TN-D-5490
Contract 129-02-21-02-25

Descriptors: *Analyzers, *Electron beams, *Energy distribution, *Magnetic fields, *Spirals, Axial loads, Electron trajectories, Energy conversion, Space charge.

For abstract, see STAR 07 24.
N69-41208 HC$3.00 MF$0.65

9B. Computers

THE DEVELOPMENT OF A COMPUTER ASSISTED DISTRIBUTION AND ASSIGNMENT (CADA) SYSTEM FOR NAVY ENLISTED PERSONNEL.
Naval Personnel Research Activity San Diego Calif
For primary bibliographic entry see Field 5I.
AD-697 933 HC$3.00 MF$0.65

CONCEPT FORMULATION AS A BASIS FOR PATTERN RECOGNITION,
Clemson Univ S C Dept of Electrical Engineering
For primary bibliographic entry see Field 6D.
AD-697 973 HC$3.00 MF$0.65

MEMORY FACTORS IN COMPUTER-CONTROLLED MAINTENANCE TRAINING.
Florida State Univ Tallahassee Computer-Assisted Instruction Center
For primary bibliographic entry see Field 5I.
AD-697 980 HC$3.00 MF$0.65

ELECTRONIC COMPUTERS. PUNCH TAPE INPUT DEVICES. GOVERNMENT STANDARDS.
Army Foreign Science and Technology Center Washington D C
17 Nov 69, 15p Rept no. FSTC-HT-23-306-69
Trans. of Russian State Standard GOST-13051-67.

Descriptors: (*Punched tape, Standards), Specifications, Temperature, Humidity, Pressure, Test methods, Storage, USSR.
Identifiers: Translations.

Punch tape input devices of electronic computers must be designed to meet government standards (GOST 13051-67). These requirements include: operating temperatures, humidity and air pressure ranges as well as specifications for the tape, the insulation, interference, etc. Testing for conformity to these requirements is outlined in detail. A thorough check must be made periodically as well as the production testing during manufacture. Requirements for labelling, packing, transport and storage are given in detail.
AD-697 986 HC$3.00 MF$0.65

MICROPROGRAMMING FACILITY,
Mitre Corp Bedford Mass
R. W. Cornelli. 29 Jul 69, 45p Rept no. MTR-921 ESD-TR-69-358
Contract F19628-68-C-0365

Descriptors: (*Programming (Computers), Data processing systems), Input-output devices, Test sets, Digital computers.
Identifiers: *Microprogramming, Interdata 3 computers.

The microprogramming facility is designed to develop and explore the technology in the relatively new field of microprogramming. This document describes the facility. (Author)
AD-697 998 HC$3.00 MF$0.65

ELECTRICAL ANALOG CALCULATOR FOR SHEAR DISTRIBUTION IN A SINGLE-TIER FACTORY BUILDING FRAMEWORK,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13M.
AD-698 113 HC$3.00 MF$0.65

SIMULATION OF A DIGITAL DETECTION SYSTEM USING A DIGITALLY CONTROLLED ANALOG COMPUTER.
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
For primary bibliographic entry see Field 9D.
AD-698 122 HC$3.00 MF$0.65

A COMPUTER GRAPHICS PROGRAM FOR THE GENERATION OF HALF-TONE IMAGES WITH SHADOWS.
Master's thesis,
Illinois Univ Urbana Coordinated Science Lab
Karl Cornell Kelley. Nov 69, 100p Rept no. R-444
Contract DAAB07-67-C-0199

Descriptors: (*Input-output devices, Display systems), (*Graphics, Programming (Computers)), Cathode ray tubes, Pictures, Geometric forms, Illumination, Theses.
Identifiers: *Computer graphics.

An approach to the solution of the hidden line problem is to compute hidden surfaces. This paper describes a working set of programs which compute not only hidden surfaces but also shadows caused by a single light source positioned away from the observer. (Author)
AD-698 124 HC$3.00 MF$0.65

MANPOWER ALLOCATION MODEL. USERS MANUAL.
Litton Systems Inc Monterey Calif Mellonics Systems Development Div
For primary bibliographic entry see Field 5I.
AD-698 128 HC$3.00 MF$0.65

PRODUCTIVITY MEASUREMENT MODEL. USERS MANUAL.
Litton Systems Inc Monterey Calif Mellonics Systems Development Div
For primary bibliographic entry see Field 5I.
AD-698 129 HC$3.00 MF$0.65

LOGICAL ASPECTS OF QUESTION-ANSWERING BY COMPUTER,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5B.
AD-698 185 HC$3.00 MF$0.65

UHELP USERS MANUAL,
Houston Univ Tex Cullen Coll of Engineering
Darshan Singh, Charles E. Donaghey, and Prem B. Dewan. Oct 69, 27p Rept no. THEMIS-RE-11-69
Contract N00014-68-A-0151

Descriptors: (*Linear programming, *Programming languages), Instruction manuals, Optimization.
Identifiers: UHELP programming language, Themis project.

A user oriented computer language for linear programming problems has been developed to overcome the difficulties encountered in using existing programs. The manual explains the use of the language. (Author)
AD-698 189 HC$3.00 MF$0.65

THE IMPLEMENTATION OF FORMULA ALGOL IN FSL,
Carnegie Inst. of Tech., Pittsburgh, Pa.
Renato Iturriaga, Tim Standish, Rudy Krutar, and Jay Earley. Oct 66, 132p
Contract SD-146
Distribution Limitation now Removed.

Descriptors: (*Programming languages, *Compilers), Syntax, Semantics, Analysis.
Identifiers: ALGOL, Formula ALGOL, List processing.

The report describes the manner in which FSL was used to implement formula ALGOL as it existed in October, 1965. Some changes have been made in formula ALGOL since that date, and consequently, an exact description of the current running system is not given. Various classes of compiler mechanisms and techniques for using FSL are revealed that should be of value to anyone desiring to understand how FSL is used to implement complex compilers of the ALGOL family. Also presented is the insight into compilation techniques that can be used to implement formula manipulation and list processing. (Author)
AD-803 577 HC$3.00 MF$0.65

GRAPHICAL MAN/MACHINE COMMUNICATIONS.
Semiannual progress rept.,
Utah Univ., Salt Lake City.
David C. Evans. 30 Nov 66, 5p
Contract AF 30 (602)-4277
Distribution Limitation now Removed.

Descriptors: (*Graphics, *Data transmission systems), (*Technical information centers, Television display systems), Digital computers, Display systems, Symbols, Video signals, Man-machine systems, Design, Digital-to-analog converters, Cathode ray tubes.
Identifiers: PDP 8 computers.

Effort has been directed toward three goals: (1) development of facilities; (2) research on generation of half-tone displays; (3) development of basic tools for construction of data structures. A fourth, but implied, goal has been the recruiting, training, and organizing of a research staff.
AD-805 134 HC$3.00 MF$0.65

DEVELOPMENT OF A MULTIDISPLAY, TIME-SHARED COMPUTER FACILITY AND COMPUTER-AUGMENTED MANAGEMENT-SYSTEM RESEARCH.
Final rept.,
Stanford Research Inst., Menlo Park, Calif.
D. C. Engelbart, W. K. English, and J. F. Rulifson. Oct 68, 183p RADC-TR-68-250
Contract AF 30 (602)-4103, ARPA Order-967
Distribution Limitation now Removed.

Descriptors: (*Management engineering, *Data processing systems), Programming (Computers), Time sharing, Display systems, Input-output devices, Compilers, Man-machine systems, Digital computers.
Identifiers: Tree meta computer program, MOL 940 programming language, Management information systems.

This report describes work in a continuing research effort on systems for computer aid to management. Specific applications to management problems include management-information systems, aids to conferencing and group interaction, and the ability to maintain highly flexible and dynamic records of various kinds and use them as a working framework. Special software developments for implementation and modification of interactive user aids include the Tree Meta compiler-compiler; the MOL940 machine-oriented programming language; four Special-Purpose Languages (SPL's), for high-level specification of user control functions; and a multipurpose interactive user-aid system (NLS) which integrates these components. These systems operate within a slightly modified version of the time-sharing system developed by Project GENIE at the University of California, Berkeley. The machine used is an SDS 940. Specially developed hardware coupled to the computer provides I/O service to six CRT user consoles. A novel display system uses small CRT's located in the computer room, with television coupling to the individual user consoles. (Author)
AD-843 577 HC$3.00 MF$0.65

SCANAL: A SINGLE CHANNEL SYNTHESIS DEPLETION CODE WITH TRIANGULAR MESH IN THE HORIZONTAL PLANE,
Gulf General Atomic, Inc., San Diego, Calif.
For primary bibliographic entry see Field 18K.
For abstract, see NSA 23 23.
GA-9423 HC$3.00 MF$0.65

CYBERNETICS AND TECHNICAL PROGRESS,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 6D.
JPRS-49352 HC$3.00 MF$0.65

CALIBRATION OF NBS SECONDARY STANDARD MAGNETIC TAPE (COMPUTER AMPLITUDE REFERENCE) USING THE REFERENCE TAPE AMPLITUDE MEASUREMENT 'PROCESS A',
National Bureau of Standards, Washington, D.C. Center for Computer Sciences and Technology.
Sidney B. Geller, Paul A. Mantek, and Norman G. Cleveland. Nov 69, 46p
Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.50.

Descriptors: (*Input-output devices, Magnetic tape), (*Magnetic tape, Standards), (*Magnetic recording systems, Standards), Calibration, Measuring devices (Electrical+ electronic), Signals.

The report describes the design and operation of the NBS signal amplitude measuring system (Process A) that is used for calibrating unrecorded Secondary Standard Magnetic Tapes (Computer Amplitude Reference). The signal level calibration is made with respect to a reference signal level derived from the NBS Master Standard Magnetic Tape (Computer Amplitude Reference) that is kept in repository at NBS. The techniques for measuring and recording the data that accompany each Secondary Standard Magenetic Tape in the form of strip chart recordings and saturation curves are described. (Author)
NBS-SP-260-18 HC$0.50 MF$0.65

PROGRESS REPORT NO. 42 ON COMPUTING AND APPLIED MATHEMATICS FOR THE HALF YEAR JANUARY 1-JUNE 30, 1969. TECHNICAL SUMMARY FOR TASK I AND V ALSO ADMINISTRATIVE AND FINANCIAL SUMMARY FOR ENTIRE CONTRACT.
New York Univ., N.Y. AEC Computing and Applied Mathematics Center.
For primary bibliographic entry see Field 12A.
For abstract, see NSA 23 23.
NYO-1480-122 HC$3.00 MF$0.65

REPRESENTATION OF THREE DIMENSIONAL SURFACE IN PERSPECTIVE BY COMPUTER.
Representation en Perspective de Surfaces A Trois Dimensions Par Ordinateur
Commissariat A L Energie Atomique, Saclay (France). Cent re D Etudes Nucleaires.
G. Zwingelstein. Jun 69, 51p CEA-R-3819
Lang- in French, English Summary

Descriptors: *Computer programs, *Dimensional analysis, *Representations, *Surface properties, Algorithms, Data processing terminals, Display devices, Drafting machines, Functions (mathematics), Recording instruments, Visual perception.

For abstract, see STAR 07 24.
N69-40154 HC$3.00 MF$0.65

AUTOMATION, SIMULATION AND DATA HANDLING IN CIVIL AVIATION BALPA TECHNICAL SYMPOSIUM.
British Air Line Pilots Association, Hayes (England).
For primary bibliographic entry see Field 1B.
For abstract, see STAR 07 24.
N69-40702 HC$3.00 MF$0.65

DESIGN METHODS FOR FAULT-TOLERANT NAVIGATION COMPUTERS.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Guidance and Control Div.
A. Avizienis. 15 Oct 69, 15p NASA-CR-106409, JPL-TR-32-1409
Contract NAS7-100

Descriptors: *Digital computers, *Engineering drawings, *Faults, *Navigation aids, Automation, Data storage, Reliability.

For abstract, see STAR 07 24.
N69-40894 HC$3.00 MF$0.65

TRANSFORM PROCESSING AND CODING OF IMAGES FINAL REPORT.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
University of Southern Calif., Los Angeles.
H. C. Andrews, and W. K. Pratt. Mar 69, 133p NASA-CR-106376, USCEE-341
Contract NAS7-100
Prep- Prepared for Jpl

Descriptors: *Coding, *Digital systems, *Fourier transformation, *Imaging techniques, Algorithms, Data processing, Error correcting devices, Matrices (mathematics), Normal density functions, Telecommunication.

For abstract, see STAR 07 24.
N69-41151 HC$3.00 MF$0.65

READ-ONLY MEMORIES FINAL REPORT.
Westinghouse Electric Corp., Baltimore, Md. Defense and Space Center.
J. R. Cricchi, W. S. Lytle, and D. D. Osullivan. Jul 69, 69p NASA-CR-106493
Contract NAS5-10610

Descriptors: *Core storage, *Metal oxide semiconductors, *Reading, *Thermal stability, Computer programming, Electrical properties, Electromigration, Integrated circuits.

For abstract, see STAR 07 24.
N69-41187 HC$3.00 MF$0.65

RESEARCH IN THE EFFECTIVE IMPLEMENTATION OF GUIDANCE COMPUTERS WITH LARGE SCALE ARRAYS INTERIM REPORT.
Hughes Aircraft Co., Fullerton, Calif.
J. A. Burke, C. P. Disparte, F. D. Erwin, J. F. Mc Kevitt, and J. J. Pariser. Sep 69, 123p NASA-CR-86256, FR-69-11-1000-REV
Contract NAS12-665
Rean- Revised

Descriptors: *Breadboard models, *Computer design, *Functional integration, *Logical elements, *Nasa programs, Digital computers, Logic circuits, Logic design, Modules, Spacecraft guidance.

For abstract, see STAR 07 24.
N69-41188 HC$3.00 MF$0.65

HELENE - A COMPUTER PROGRAM TO CALCULATE NUCLEAR CROSS SECTIONS EMPLOYING THE HAUSER-FESHBACH MODEL, PORTER-THOMAS WIDTH FLUCTUATIONS, AND CONTINUUM STATES,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 20H.
For abstract, see NSA 23 23.
ORNL-TM-2590 HC$3.00 MF$0.65

SUPERTOG: A PROGRAM TO GENERATE FINE GROUP CONSTANTS AND P sub n SCATTERING MATRICES FROM ENDF/B,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18K.
For abstract, see NSA 23 23.
ORNL-TM-2679 HC$3.00 MF$0.65

SANDIA DATA ACQUISITION AND DISPLAY SYSTEM: MONITOR SYSTEMS,
Sandia Labs., Albuquerque, N. Mex.
R. F. Davis. Oct 69, 42p SC-M-69-493

Descriptors: (*Data processing systems, Programming (Computers)), Display systems, Input-output devices, Computer storage devices, Real time, Scheduling, Compilers, Control systems.
Identifiers: *Batch processing, *Monitor routines, Data acquisition.

The document describes the Batch Processing (Mass Storage) monitor and the Real Time (ASSET) monitor which are used by the Sandia Data Acquisition and Display System (DADS) computer. A knowledge of the Batch Processing monitor will be useful for anyone intending to use the DADS computer. (Author)
PB-187 969 HC$3.00 MF$0.65

LAND USE AND NATURAL RESOURCE INVENTORY OF NEW YORK STATE,
New York State Office of Planning Coordination, Albany.
For primary bibliographic entry see Field 5A.
PB-187 986 HC$3.00 MF$0.65

A COMPUTERIZED BLOOD INVENTORY SYSTEM IN THE SERVICE OF THE COMMUNITY, THE BLOOD DONOR AND THE PATIENT-RECIPIENT.
Technical rept. 15 Sep 68-25 Jun 69,
Community Blood Council of Greater New York, N.Y.
A. Kellner, Robert L. Hirsch, and Julian B. Schorr. Jun 69, 359p
Contract PH-43-68-1403
Prepared in cooperation with Riverside Research Inst., New York, N.Y.

Descriptors: (*Data processing systems, Inventory control), (*Inventory control, *Blood), Blood groups, Storage, Models (Simulations), Information retrieval, Management control systems.
Identifiers: Blood banks.

Contents: Survey of hospital blood banks; Detailed study of a regional blood distribution center; Detailed study of several individual hospital blood banks; Simulation studies; Automated registration of donors; Preliminary evaluation of a pilot model of a blood inventory and information system; Preliminary evaluation of a prototype blood resources management system; Functional system analysis. (Author)
PB-188 002 HC$3.00 MF$0.65

REPORT AND RECOMMENDATIONS ON THE DEVELOPMENT OF A STATE INFORMATION SYSTEM FOR SOUTH CAROLINA.
EDP Technology, Inc., Falls Church, Va.

1 Oct 69, 103p
Sponsored by Department of Housing and Urban Development, Washington, D.C.

Descriptors: (*Data processing systems, *South Carolina), (*Information retrieval, Data processing systems), Computer personnel, Computers, Inventory, Reviews.
Identifiers: Information systems.

The report summarizes a comprehensive survey of South Carolina agencies and their computers. The survey covered the computers, personnel and applications of operating line agencies, and an analysis of the current status is presented. Recommendations are discussed in terms of long-range goals concerning a strategy and methodology for optimum computer usage for the state. An action plan is suggested for immediate implementation, and provides the logical and sequential steps required to achieve the long-range goals. (Author)
PB-188 041 HC$3.00 MF$0.65

PLOTR: A TWO-DIMENSIONAL CONTOURING AND AREA-CALCULATING ROUTINE.
Sandia Labs., Albuquerque, N. Mex.
For primary bibliographic entry see Field 18H.
PB-188 100 HC$3.00 MF$0.65

USER'S GUIDE FOR THE COMPUTER PROGRAM DESCRIBED IN TAM REPORT NO. 680 'DETERMINATION OF VOLUME CHANGE STRESSES IN PLAIN AND REINFORCED CONCRETE USING FINITE ELEMENT ANALYSIS',
Illinois Univ., Urbana. Dept. of Theoretical and Applied Mechanics.
Hassan M. Rejali. Aug 69, 51p

Descriptors: (*Concrete, Stresses), (*Computer programs, Instruction manuals), Reinforced concrete, Numerical analysis, Programming (Computers), Data processing systems, Punched cards, Programming languages.
Identifiers: VCSC computer program, Volume change stresses, Finite element methods, FORTRAN 4, Computer analysis.

The document gives input data instructions for the computer program VCSC (Volume Change Stresses in Concrete) which is written in Fortran 4 for the solution of 'Stresses Caused by Volume Change in Plain and Reinforced Concrete' (a mathematical model). The program, which uses the finite element method of stress analysis, can also be applied to cases concerned with external loads and/or displacements.
PB-188 188 HC$3.00 MF$0.65

9C. Electrical and Electronic Engineering

ELECTRON MICROSCOPIC INVESTIGATION OF THIN METAL-POLYMER COATINGS AND FILMS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11C.
AD-697 918 HC$3.00 MF$0.65

VACUUM DEPOSITION OF THIN FILMS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13H.
AD-698 108 HC$3.00 MF$0.65

MANPOWER STANDARDS FOR MAINTENANCE OF ELECTRONIC EQUIPMENT (1969).
Weather Bureau, Silver Spring, Md. Engineering Div.
For primary bibliographic entry see Field 5I.
PB-188 038 HC$3.00 MF$0.65

9D. Information Theory

SIMULATION OF A DIGITAL DETECTION SYSTEM USING A DIGITALLY CONTROLLED ANALOG COMPUTER.
Technical rept.,
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
A. A. Pandiscio, and D. W. Tufts. Jul 69, 52p Rept no. TR-593
Contract N00014-67-A-0298-0006

Descriptors: (*Demodulators, Digital systems), Simulators, Analog computers, Computer logic, Signals, Detection, Sampling, Information theory, Signal-to-noise ratio, Probability, Correlators, Man-machine systems.
Identifiers: Computerized simulation.

The usefulness of a digitally controlled analog computer in studying digital detection systems was examined. A program was developed for a computer equipped with parallel logic elements. Experience with the system shows it to be a very useful tool for such studies particularly because of the excellent man machine interaction and also because of a possible cost advantage. (Author)
AD-698 122 HC$3.00 MF$0.65

ERROR MECHANISMS FOR CONVOLUTIONAL CODES.
Doctoral thesis,
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
Edward A. Bucher. 29 Aug 69, 78p Rept no. TR-471
Contract DA-28-043-AMC-02536 (E), Grant NGL-22-009-013

Descriptors: (*Coding, Errors), Probability, Decoding, Shift registers, Sequences, Algorithms, Theses.
Identifiers: Error correction codes, Convolutional codes.

Upper and lower bounds to the probability of error for convolutional codes are presented. The lower bound is derived for an optimum decoder with convolutional codes in which each of the V channel symbols generated per encoder shift may have a different 'constraint length.' The Fano sequential decoding algorithm is also investigated. An upper bound to the a th moment of decoder computation is obtained for arbitrary decoder bias B and a< or= 1. An upper bound on error probability with sequential decoding is derived for both systematic and nonsystematic convolutional codes. This error bound involves the exact value of the decoder bias B. There is a trade-off between sequential decoder computation and error probability as the bias B is varied. Also, for many values of B, sequential decoding of systematic convolutional codes gives an exponentially larger error probability than sequential decoding of nonsystematic convolutional codes when both codes are designed with exponentially equal optimum decoder error probabilities. (Author)
AD-698 157 HC$3.00 MF$0.65

9E. Subsystems

ANTENNA DATA ANALYSIS SYSTEM.
Technical rept.,
IIT Research Inst., Annapolis, Md.
M. J. Sanchez, and T. J. Lawson. Feb 66, 52p ESD-TR-66-3
Contract AF 19 (628)-5049
Distribution Limitation now Removed. See also AD-482 996.

Descriptors: (*Antenna radiation patterns, *Programming (Computers)), Analysis, Antennas, Programming languages, Statistical analysis, Statistical data, Information theory.

The antenna data analysis system is a computer program, In FORTRAN IV language, for reducing antenna radiation data to a statistical form. The system development involved taking several separate programs that had been developed for different tasks and welding them into one system, With enough controls to allow the engineer wide versatility in selecting the statistical representation best suited to his analysis problem. (Author)
AD-477 665 HC$3.00 MF$0.65

AN INVESTIGATION OF DESCRIBING FUNCTION DEVELOPMENT.
Master's thesis.
Naval Postgraduate School, Monterey, Calif.
Jerry Michael Loveless. May 66, 257p
Distribution Limitation now Removed.

Descriptors: (*Adaptive control systems, Stability), (*Servomechanisms, Functions), Nonlinear systems, Transfer functions, Feedback, Computer programs, Gain, Hysteresis, Tables, Theses.
Identifiers: Control theory, Feedback control.

The paper reviews some of the most common methods of describing function development. The describing function has been used primarily for stability analysis on the nichols, polar, and nyquist plots. This paper shows the use of the real and imaginary components of the describing function on the parameter plane. In addition a generalized digital computer program is developed for generating describing function data for a large class of nonlinearities. Data are computed and tabulated for a number of common nonlinearities, and these tables are included as an appendix.
AD-487 843 HC$3.00 MF$0.65

AUTOMATIC MICROWAVE CIRCUIT ANALYSIS WITH GCP-MOD2.
Technical note,
Massachusetts Inst of Tech Lexington Lincoln Lab
William J. Getsinger, and Thomas E. Maggiacomo. 10 Jul 69, 46p Rept no. TN-1969-34 ESD-TR-69-204
Contract AF 19 (628)-5167

Descriptors: (*Microwave equipment, Programming (Computers)), (*Electrical networks, Analysis), Circuits, Microwave frequency, Transmission lines, Electric filters.
Identifiers: GCP-MOD2 computer program, Equivalent circuits, Network analysis theory.

GCP-MOD2 is an extremely rapid means for performing frequency analyses of equivalent circuits of cascaded two-ports. An operator describes his circuit to GCP-MOD2, using an abbreviated plain English vocabulary, and specifies measurements to be made at an appropriate terminal plane for frequencies of interest. GCP communicates laconically with the operator as it accepts the circuit description and any other instructions. It then tabulates the results of the measurements, and awaits further instructions, such as circuit modifications or different measurements. As a typical example, a microwave filter circuit, made up of lengths of transmission line and five resonators, of both lumped and distributed elements, can be described to GCP and evaluated at a dozen frequencies for such measurements as insertion loss, transmission phase-shift, and input impedance, all in about 10 minutes. (Author)
AD-697 954 HC$3.00 MF$0.65

RESEARCH STUDY AND DEVELOPMENT OF AN INTEGRATED CIRCUIT.
TRW Systems Group Redondo Beach Calif
For primary bibliographic entry see Field 9F.
AD-697 959 HC$3.00 MF$0.65

STANDARD FOR RECEIVING BAND SHORT WAVE ANTENNAS USED FOR FIXED RADIO STATIONS AND RADIO RECEIVING CENTERS.
Army Foreign Science and Technology Center Washington D C

10 Nov 69, 19p Rept no. FSTC-HT-23-777-68
Trans. of Russian State Standard GOST 6497-67.

Descriptors: (*Antennas, Radio stations), Standards, Antenna components, Wire, High frequency, USSR.
Identifiers: Translations.

The standard describes the dimensions and construction of short wave receiving antennas. It establishes the method of making, which includes the formula describing the length and diameter of the vibrator arm, height of the antennas, and the initial letter abbreviation which denotes the type of antenna. Methods of testing are discussed, specifying the type of testing equipment to be used in each phase of measurement and checking. (Author)
AD-698 164 HC$3.00 MF$0.65

CYCLOTRON-TYPE MILLIMETER BAND AMPLIFIER,
Army Foreign Science and Technology Center Washington D C
I. A. Antakov, V. A. Zhurakhovskii, and G. N. Rapoport. 19 Nov 69, 8p Rept no. FSTC-HT-23-197-70
Trans. of Patent (USSR) 224 713, 27 Sep 69.

Descriptors: (*Microwave amplifiers, Traveling-wave tubes), Patents, Waveguides, Solenoids, Helixes, Millimeter waves, USSR.
Identifiers: Translations.

The invention pertains to the class of ultrahigh frequency electrovacuum devices. The proposed amplifier makes it possible to eliminate the self-excitation and to increase the gain. This is achieved by the cross-sectional dimensions of the waveguide system smoothly (adiabatically) increasing from the middle of the wave guide to the power input and output. In this case, the intensity of the longitudinal magnetostatic field controlling the helical electron stream is smoothly reduced from the middle to the ends of the waveguide system, which is assured by a corresponding distribution of the ampereturns of the solenoid. This condition in particular is satisfied by a distribution of the solenoid field with a uniform density of the ampere turns at a specific ratio of the length of the solenoid to its diameter. (Author)
AD-698 167 HC$3.00 MF$0.65

OUTDOOR WIRE FEEDERS FOR ANTENNAE.
Army Foreign Science and Technology Center Washington D C

10 Nov 69, 16p Rept no. FSTC-HT-23-301-69
Trans. of Russian State Standard GOST 6917-67.

Descriptors: (*Antenna feeds, Standards), High frequency, USSR.
Identifiers: Translations.

The government standard (GOST 13051-67) covers three groups of wire feeders for antennae of transmitters or receivers. They are: balanced, unbalanced (coaxial), composite (shielded). Surge impedence, diameter and type of wire are included for various feeder types. Requirements for feeder supports include the support itself, how the feeders are suspended, and distances to other objects. Specifications for insulators used and test methods for feeders and insulators are covered. (Author)
AD-698 168 HC$3.00 MF$0.65

CALCULATION OF GLAZE WIND LOADS UPON HIGH INSTALLATIONS,
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 13M.
AD-698 172 HC$3.00 MF$0.65

AN EXPERIMENTAL CYCLO CONVERTER.
Technical rept.,
Royal Aircraft Establishment Farnborough (England)
R. J. K. Splatt. Oct 67, 52p Rept no. RAE-TR-67270

Descriptors: (*Frequency converters, *Electric governors), Switching circuits, Transistors, Induction motors, Great Britain.
Identifiers: Thyristors.

A 2 phase cyclo convertor whose output frequency can be varied between 1/4 and 100 Hz is described in detail. It is capable of supplying power to resistive and inductive loads or for controlling the speed of an 8 hp induction motor. (Author)

AD-698 175 HC$3.00 MF$0.65

INVESTIGATION OF THE GUNN EFFECT IN GALLIUM ARSENIDE.
Naval Postgraduate School, Monterey, Calif.
For primary bibliographic entry see Field 20L.
AD-800 479 HC$3.00 MF$0.65

THE ANALYSIS OF INTERFERENCE TO PHASE AND FREQUENCY FEEDBACK SYSTEMS.
Technical rept.,
IIT Research Inst., Annapolis, Md.
R. Mayher. Mar 67, 29p ESD-TR-66-8
Contract AF 19 (628)-5049
Distribution Limitation now Removed.

Descriptors: (*Electromagnetic compatibility, *Radiofrequency interference), (*Phase detectors, Radiofrequency interference), Voltage-controlled oscillators, Phase (Electronics), Feedback, Low-pass filters, Intermediate frequency, Mixers (Electronics), Mathematical analysis.

The analysis of the phase difference between an input signal, which consists of a desired signal and an undesired interfering signal, and a reference oscillator in a feedback system is discussed. The ordinary small angle linearization is adapted to solve the problem. The total mean square phase error is obtained as a function of the desired and undesired power ratio. With the aid of these results and a particular interference threshold, It is then possible to determine the amount of mean square or root mean square error due to interference and an acceptable limit of the signal-to-interference ratio that can be tolerated. (Author)
AD-810 164 HC$3.00 MF$0.65

THERMAL SHOCK EVALUATION OF THE MORE COMMON TYPES OF PRINTED CIRCUIT BOARD INTERFACIAL CONNECTIONS.
Technical memo.,
Picatinny Arsenal, Dover, N.J.
Dominic R. Delli Sante, and Erle N. Niemi. Jul 65, 90p PA-TM-1686
Distribution Limitation now Removed.

Descriptors: (*Printed circuits, Thermal shock), (*Circuit interconnections, Thermal shock), Specifications, Failure (Electronics), Test methods, Plating.

The report describes a study of the merits of various printed circuit board interfacial connections. These interfacial connections were subjected to extensive thermal shock cycling in order to determine their effectiveness. The results of this thermal shock cycling program will be utilized along with the results of other testing in the preparation of specifications and standards for government and industry. The other testing programs included insulation degradation and flexural fatigue. (Author)
AD-815 608 HC$3.00 MF$0.65

GAPLESS ELECTROLUMINESCENT DISPLAYS.
Final rept. Apr-Nov 66,
Hartman-Huych Systems Co., Huntington Station, N.Y.
Everett J. Kelley. Aug 67, 28p AFFDL-TR-67-57
Contract AF 33 (615)-3685
Distribution Limitation now Removed.

Descriptors: (*Display systems, Electroluminescence), Voltage, Films, Electric insulation, Masking, Control systems, Circuits, Capacitance, Electrodes, Aircraft equipment.
Identifiers: *Electroluminescent panels.

An experimental study of the lamination of electroluminescent (EL) display control electrodes, is described. The study included selection and test of suitable voltage barrier materials, for separation of adjacent or overlapping layers of electrodes. The material finally selected, polymeric 1,4-dimethylbenzene, proved to have very high dielectric strength, coupled with continuous pin-hole free film characteristics when used in very thin film layers. Films of 2 to 2.5 microns thickness proved to be adequate for electrical isolation of adjacent or overlapping electrodes, at 250 volt 400 hertz, with a minimum of voltage drop across the insulating film. Techniques for handling this film were investigated, and gapless bargraph and numeric electroluminescent (EL) displays were fabricated to demonstrate this method's effectiveness of construction. (Author)
AD-821 838 HC$3.00 MF$0.65

BULK SEMICONDUCTOR CONTROL CIRCUITRY FOR SOLID STATE DISPLAYS.
Technical rept. Mar-Aug 66,
ITT Federal Labs., Fort Wayne, Ind.
Burton A. Babb. Feb 68, 74p AFFDL-TR-67-159
Contract AF 33 (615)-3564
Distribution Limitation now Removed.

Descriptors: (*Switching circuits, Semiconductor devices), Electroluminescence, Display systems, Electrical properties, Hysteresis, Resistors, Feasibility studies.
Identifiers: Electroluminescent panels.

Properties of electroluminescent display elements and bulk-phenomena semiconductor switching circuits are explored. Definitions of switching requirements for various configurations of semiconductor controlled x-y input, electroluminescent matrices are developed. Measurements are described which define the properties, and problems of various types of bulk-phenomena switches. A description is included of several practical display matrices which utilize conventional semiconductor elements in novel circuits, as is an argument favoring the use of these conventional components. (Author)
AD-829 189 HC$3.00 MF$0.65

INTEGRATION OF HIGH CONTRAST SOLID-STATE DISPLAYS AND ADVANCED CONTROL CIRCUITRY.
Lear Siegler, Inc., Grand Rapids, Mich. Instrument Div.
For primary bibliographic entry see Field 1D.
AD-835 375 HC$3.00 MF$0.65

GROUND PLANE PRINTED CIRCUIT BOARDS BY REFRACTED PHOTOGRAPHIC METHOD,
New York Operations Office (AEC), N.Y. Health and Safety Lab.
F. Wilson. May 69, 9p*

Descriptors: (*Printed circuits, Manufacturing methods), Photographic techniques, Refraction.

For abstract, see NSA 23 23.
HASL-208 HC$3.00 MF$0.65

APPLICATION OF PRESSURIZED LIQUID NITROGEN INSIDE PARAMETRIC-AMPLIFIER STRUCTURES FOR INPUT-NOISE-TEMPERATURE IMPROVEMENT.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
H.-J. Blume. Oct 69, 31p NASA-TN-D-5509
Contract 125-21-04-05-23

Descriptors: *Ambient temperature, *Gas pressure, *Liquid nitrogen, *Noise reduction, *Parametric amplifiers, Conductive heat transfer, Cooling, Diodes, High gain, Resonant frequencies.

For abstract, see STAR 07 24.
N69-40079 HC$3.00 MF$0.65

APPLICATION OF MODERN NETWORK THEORY TO ANALYSIS OF COMPLEX SYSTEMS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
J. C. Faken. Oct 69, 46p NASA-TN-D-5511
Contract 120-27

Descriptors: *Analysis (mathematics), *Electric networks, *Systems analysis, *Theories, Digital computers, Matrices (mathematics), Mechanical properties, Network synthesis.

For abstract, see STAR 07 24.
N69-40088 HC$3.00 MF$0.65

PULSE-RESPONSE CURVES OF CONVENTIONAL LOW-PASS FILTERS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
D. M. Higgins, and W. D. Stanley. Oct 69, 116p NASA-TN-D-5494
Contract 125-17-06-01-23

Descriptors: *Digital filters, *Low pass filters, *Pulse amplitude, *Pulse duration, *Transient response, Bandwidth, Bessel functions, Chebyshev approximation, Computerized simulation.

For abstract, see STAR 07 24.
N69-40099 HC$3.00 MF$0.65

RADIATION FROM SLOTS ON CYLINDRICAL BODIES USING GEOMETRICAL THEORY OF DIFFRACTION AND CREEPING WAVE THEORY.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
For primary bibliographic entry see Field 20N.
For abstract, see STAR 07 24.
N69-40128 HC$3.00 MF$0.65

DIRECTIVE GAIN OF CIRCULAR TAYLOR PATTERNS.
Ohio State Univ., Columbus. Dept. of Electrical Engineering.
R. C. Rudduck, and D. C. Wu. 12 Aug 69, 13p NASA-CR-66850, TR-1691-32
Contract NGR-36-008-005

Descriptors: *Antenna radiation patterns, *Chebyshev approximation, *Directivity, *Sidelobe reduction, Amplification, Apertures, Bessel functions, Numerical integration.

For abstract, see STAR 07 24.
N69-40143 HC$3.00 MF$0.65

S-BAND POWER AMPLIFIER - IMPROVEMENT PROGRAM FINAL REPORT.
Collins Radio Co., Cedar Rapids, Iowa.
L. G. Baldwin. 1968, 141p NASA-CR-101964
Contract NAS9-8142

Descriptors: *Electric equipment tests, *Power amplifiers, *Power supply circuits, *Revisions, *Switching circuits, Circuit diagrams, Component reliability, Ferrites, Service life, Superhigh frequencies, Ultrahigh frequencies.

For abstract, see STAR 07 24.
N69-40872 HC$3.00 MF$0.65

A MONOLITHIC IMAGE SENSOR FOR A READING AID FOR THE BLIND.
Stanford Univ., Calif. Stanford Electronics Labs.
For primary bibliographic entry see Field 6L.
PB-186 324 HC$3.00 MF$0.65

USER'S MANUAL FOR ACCEL SYSTEM (MOD 2),
Sandia Labs., Albuquerque, N. Mex.
Clifford J. Fisk, and David L. Caskey. Nov 69, 106p SC-M-69-601

Descriptors: (*Programming (Computers), Printed circuits), (*Printed circuits, Design), Production, Instruction manuals, Iterative methods, Circuit interconnections.
Identifiers: ACCEL computer program; Computer aided design.

ACCEL is a set of computer programs designed to aid in construction of electronic printed circuit boards. ACCEL has the capability to produce all the design information required by a printed circuit fabrication shop for construction of the boards. Input information is furnished by the circuit designer in the form of a circuit schematic drawing, and information on the parts used in the circuit. This information is then transcribed onto punched cards. The computer output is graphical in the form of several plots. These include (1) a schematic drawing, (2) a parts list, (3) an assembly drawing showing the location of parts on the printed circuit board, (4) a hole-drilling coordinate list, and (5) masks to be used in etching the circuit board layers. Thus, the ACCEL system performs four major tasks. First, it edits the engineers' data, resolves the schematic into a node-component list, looks up physical and electrical data for the parts used in the circuit, and notes any errors in the data. Second, it locates the components on the board by an iterative process. Third, the program lays out the interconnection pattern between the components. Fourth, ACCEL generates the output plots. Consequently, the use of ACCEL can significantly reduce the time required to produce a finished printed circuit board. (Author)
PB-188 152 HC$3.00 MF$0.65

9F. Telemetry

RESEARCH STUDY AND DEVELOPMENT OF AN INTEGRATED CIRCUIT.
Final rept. Oct 66-Apr 69,
TRW Systems Group Redondo Beach Calif
Dan J. Dooley. Dec 69, 60p Rept no. 07308-6001-RO-00 AEDC-TR-69-253
Contract AF 40 (600)-1188

Descriptors: (*Telemetering transmitters, *Integrated circuits), Design, Projectiles, Gun launched, Acceleration, Reliability (Electronics), Manufacturing methods, Microminiaturization (Electronics), Very high frequency.

The design of a hybrid microminiaturized telemetry unit for use in gun launched projectiles is described. High peak accelerations during launch and short duration flight (2 milliseconds) were two prime considerations during design. Initial tests indicated that this type of fm telemetry in the 150 mc frequency range would be feasible for aerodynamic measurements. (Author)
AD-697 959 HC$3.00 MF$0.65

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

THE INFLUENCE OF AERODYNAMICS IN WIND POWER DEVELOPMENT,
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 10B.
N63-80507 HC$3.00 MF$0.65

10B. Power Sources

DESIGN AND ANALYSIS OF SOLAR CELL ARRAY CONFIGURATIONS FOR VERTICALLY STABILIZED SATELLITES IN NEAR-EARTH ORBITS.
Technical memo.,
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
Walter E. Allen. Aug 69, 156p* Rept no. APL-TG-1066
Contract NOw-62-0604

Descriptors: (*Satellites (Artificial), Power equipment), (*Solar panels, Configuration), Solar cells, Design, Satellite attitude, Low-orbit trajectories, Storage batteries, Reliability (Electronics), Space environmental conditions, Radiation damage, Solar radiation, Illumination, Stabilization systems, Celestial mechanics, Albedo, Performance (Engineering), Spacecraft.
Identifiers: *Solar cell arrays, *Spacecraft electric power units, Nickel cadmium batteries, Shadows, Vertically stabilized satellites, Evaluation.

Solar array configuration design and analysis techniques are developed from basic solar cell performance characteristics. The relationship between the array and other elements in the power system is presented with emphasis on nickel-cadmium battery characteristics as they relate to the design of the array. The predictable solar orientation patterns for two and three axis vertically stabilized spacecraft are examined in detail. The influence of the orbit upon the design of the array and methods for predicting sunlight exposure time and integrated average array power are introduced. The effects of the orbit environment upon array performance including variations in solar illumination intensity, degradation caused by particle irradiation, and the potential influence of earth albedo are discussed. Finally, a specific array design is undertaken for a vertically stabilized spacecraft with a constant 20-watt electrical load. The design, although specific, demonstrates solar-array design principles and techniques that are universally applicable. (Author)
AD-697 902 HC$3.00 MF$0.65

DESIGN OF AIRCRAFT ELECTRIC POWER SUPPLY SYSTEMS,
Army Foreign Science and Technology Center Washington D C
G. D. Vlasov. 6 Nov 69, 467p Rept no. FSTC-HT-23-259-69
Trans. of mono. Mashinostroenie, n.p., 1967 p1-411.

Descriptors: (*Power supplies, Aircraft), Design, Weight, Reliability (Electronics), Electric currents, Generators, Voltage regulators, Stand-by generators, USSR.
Identifiers: Translations.

The report describes the possible variations of aircraft electric power systems. It discusses the merits and faults of types of current, generators, equipment, conductors, drives. Numerous circuit diagrams show how to avoid catastrophy in case of failure of individual power sources, lines, convertors, etc. The most promising types and systems are recommended. An example of a draft of an airplane's power system is given. (Author)
AD-697 985 HC$3.00 MF$0.65

VEHICLE MOUNTED THERMOELECTRIC BATTERY CHARGES.
Rept. no. 13 (Final), 1 Jul 67-24 Apr 69,
Minnesota Mining and Mfg. Co., St. Paul. Space and Defense Products Dept.
Thomas L. Nystrom, Edwin W. Pitcher, and John H. Stauffer. Jul 69, 46p* ECOM-0543-F
Contract DAAB07-67-C-0543
Distribution Limitation now Removed.

Descriptors: (*Battery chargers, Design), (*Thermionic converters, Design), Vehicle accessories, Thermocouples, Combustion chambers, Fuel systems, Fuel sprays, Cooling fans, Electric power production, Heat of combustion, Circuit interconnections, Hydrocarbons, Test methods, Performance (Engineering), Reliability (Electronics), Physical properties, Corrections, Army equipment.
Identifiers: Ultrasonic atomizers, Evaluation.

The report describes the progress made in the development of thermoelectric battery chargers. The objective of this program is the design, fabrication, testing, and delivery of thermoelectric battery chargers in two sizes which are capable of producing 300 and 560 watts at 28 volts, and which utilize liquid hydrocarbon fuels of the type that are logistically available in the field. An additional objective is the design and fabrication of a thermoelectric converter which is capable of producing 1100 watts at 36 volts, together with associated hardware needed to support the converter for heating and cooling purposes. (Author)
AD-857 058 HC$3.00 MF$0.65

PERFORMANCE EVALUATION OF A THERMIONIC CONVERTER USING A GRAPHITE INTEGRAL RESERVOIR,
Gulf General Atomic, Inc., San Diego, Calif.
A. J. Gietzen. 16 Apr 69, 22p
Contract AT (04-3)-167

Descriptors: (*Thermionic converters, Graphite), Cesium, Performance (Engineering).

For abstract, see NSA 23 23.
GA-9163 HC$3.00 MF$0.65

THE INFLUENCE OF AERODYNAMICS IN WIND POWER DEVELOPMENT,
Advisory Group for Aeronautical Research and Development, Paris (France).
E. W. Golding. 1961, 49p AGARD-401
NATO furnished.

Descriptors: (*Electric power production, *Wind), Aerodynamics, Sources, Site selection, Design, Performance (Engineering).
Identifiers: *Windmills, *Wind power generation.

After a brief account of the recent history of windmills the paper deals with the characteristics of the wind as a source of power and outlines the methods of obtaining and analysing wind data as a basis for assessment of the economic potentialities of wind power utilization. The selection of favourable sites for wind power installations is then discussed, and this subject is followed by notes on the design and performance of windmills of different types and sizes under various conditions of use. Later sections cover the utilization of wind-generated energy and the needs for research and development along specified lines. (Author)
N63-80507 HC$3.00 MF$0.65

A PARASITIC LOAD SPEED CONTROL FOR DYNAMIC SPACE POWER SYSTEMS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
H. M. Holt. Aug 69, 95p NASA-TM-X-61901

Descriptors: *Mathematical models, *Spacecraft power supplies, *Speed control, *Thermodynamic cycles, *Turbogenerators, Energy conversion efficiency, Engine control, Loads (forces).

For abstract, see STAR 07 24.
N69-40006 HC$3.00 MF$0.65

THE SOLAR ARRAY SYNTHESIS COMPUTER PROGRAM.
General Electric Co., Philadelphia, Pa. National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A. F. Obenschain, and R. Rasmussen. Sep 69, 60p
NASA-TM-X-63709, X-716-69-390
Contract NAS5-10158
Prep- Prepared By Ge

Descriptors: *Computer programs, *Performance prediction, *Solar cells, *Spacecraft power supplies, Electric potential, Irradiation, Photovoltaic conversion.

For abstract, see STAR 07 24.
N69-40246 HC$3.00 MF$0.65

THE RELATION BETWEEN SOLAR CELL FLIGHT PERFORMANCE DATA AND MATERIALS AND MANUFACTURING DATA QUARTERLY REPORT.
Cara Corp., Philadelphia, Pa.
S. R. Pollack. 16 Sep 69, 29p NASA-CR-106355, QR-4

Contract NASW-1732

Descriptors: *Aerospace environments, *Data acquisition, *Flight characteristics, *Solar cells, Analysis (mathematics), Manufacturing, Materials, Tables (data).

For abstract, see STAR 07 24.
N69-40422 HC$3.00 MF$0.65

MOTOR-STARTING CHARACTERISTICS OF TWO INDUCTOR ALTERNATORS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
C. S. Corcoran, D. S. Repas, and M. E. Valgora.
Oct 69, 13p NASA-TM-X-1912
Contract 120-27

Descriptors: *Ac generators, *Inductors, *Synchronous motors, Brayton cycle, Volt-ampere characteristics.

For abstract, see STAR 07 24.
N69-40440 HC$3.00 MF$0.65

THERMIONIC CONVERTERS - SIRENE IRRADIATION DEVICE.
Dispositif D'experimentation en Pile des Convertisseurs Thermioniques Sirene
Commissariat A L Energie Atomique, Saclay (France). Centre D'etudes Nucleaires.
J. Bliaux, J.-P. Durand, and G. Lazare-chopard.
Aug 69, 23p CEA-R-3867
Lang- in French, English Summary Conf- Presented At the Meeting of the Euratom Working Group on Irradiation Devices, Ispra, Italy, 21-22 May 1969

Descriptors: *Nuclear reactors, *Thermionic converters, *Vacuum, Conferences, Life (durability), Nuclear energy, Performance tests, Pile foundations.

For abstract, see STAR 07 24.
N69-40470 HC$3.00 MF$0.65

MARTIAN ENVIRONMENTAL EFFECTS ON SOLAR CELLS AND SOLAR CELL COVER GLASSES QUARTERLY REPORT.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Texas Technological Coll., Lubbock. Dept. of Geosciences.
F. A. Wade. 15 Oct 69, 14p NASA-CR-106385, TTU-3301
Contracts NAS7-100, JPL-952582
Prep- Prepared for Jpl

Descriptors: *Environmental tests, *Lunar dust, *Lunar programs, *Solar cells, Degradation, Electrical properties, Mars atmosphere.

For abstract, see STAR 07 24.
N69-40532 HC$3.00 MF$0.65

ONE VOLT ISOTOPIC MICROGENERATORS.
Commissariat A L Energie Atomique, Saclay (France). Centre D Etudes Nucleaires.
For primary bibliographic entry see Field 18N.
For abstract, see STAR 07 24.
N69-40586 HC$3.00 MF$0.65

RADIATION EFFECTS IN SILICON SOLAR CELLS QUARTERLY REPORT.
Gulf General Atomic, San Diego, Calif. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
R. A. Berger, H. Horiye, J. A. Naber, and B. C. Passenheim. 10 Oct 69, 24p NASA-CR-106368, GA-9756
Contracts NAS7-100, JPL-952387
Prep- Prepared for Jpl

Descriptors: *Crystal defects, *Electron irradiation, *Electron paramagnetic resonance, *Radiation effects, *Silicon alloys, Annealing, Holes (electron deficiencies), Lithium, Solar cells.

For abstract, see STAR 07 24.
N69-40757 HC$3.00 MF$0.65

INVESTIGATION INTO THE MECHANISM OF DEGRADATION OF SOLAR CELLS WITH SILVER- TITANIUM CONTACTS QUARTERLY PROGRESS REPORT, 1 APR. - 30 JUN. 1969.
Boeing Co., Seattle, Wash. Aerospace Group.
30 Jun 69, 46p NASA-CR-106405, D2-126194-1
Contract NASW-1859

Descriptors: *Degradation, *Electrochemical corrosion, *Electrolytes, *Humidity, *Silicon, *Solar cells, Hydrogen, Titanium, X ray diffraction.

For abstract, see STAR 07 24.
N69-40775 HC$3.00 MF$0.65

CONCEPTUAL DESIGN AND STRUCTURAL MODEL OF A 560-WATT THIN-FILM SOLAR-CELL ARRAY.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
F. J. Stenger. Oct 69, 14p NASA-TM-X-1913
Contract 120-33

Descriptors: *Scale models, *Solar cells, *Thin films, Acceptability, Aerospace engineering, Booms (equipment), Cadmium sulfides.

For abstract, see STAR 07 24.
N69-40787 HC$3.00 MF$0.65

RESEARCH AND DEVELOPMENT OF ELECTROFORMED ALUMINUM SOLAR CELL CONTACTS AND INTERCONNECTS PERIODIC PROGRESS REPORT, 5 JUN. - 4 OCT. 1969.
Electro-optical Systen.., Inc., Pasadena, Calif. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
K. Lui. 21 Oct 69, 29p NASA-CR-106383, EOS-4039-Q-1
Contract NAS7-100
Prep- Prepared for Jpl

Descriptors: *Aluminum, *Component reliability, *Contact potentials, *Electroforming, *Solar cells, Optimization, Photoconductors, Production engineering, Silicon junctions.

For abstract, see STAR 07 24.
N69-40927 HC$3.00 MF$0.65

ROLLUP SUBSOLAR ARRAY QUARTERLY TECHNICAL REPORT, 1 JUN. - 31 AUG. 1969.
General Electric Co., Philadelphia, Pa. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Valley Forge Space Center.
15 Sep 69, 228p NASA-CR-106367, GE-SSO-69SD4351
Contracts NAS7-100, JPL-952314
Prep- Prepared for Jpl

Descriptors: *Auxiliary power sources, *Components, *Matrix methods, *Rollers, *Solar collectors, Arrays, Engineering drawings, Experimental design, Housings, Modal response, Research and development.

For abstract, see STAR 07 24.
N69-40929 HC$3.00 MF$0.65

ENGINEERING STUDY OF ELEVATED TEMPERATURE SOLAR CELL PANEL FABRICATION TECHNIQUES SUMMARY REPORT, 1 JUN. 1968 - 15 MAY 1969.
Hughes Aircraft Co., Culver City, Calif.
D. B. Cohen, and S. Schwartz. Sep 69, 111p NASA-CR-73352
Contract NAS2-4878

Descriptors: *High temperature, *Solar cells, *Thermal resistance, Aluminum, Epoxy resins, Glass fibers, Substrates, Systems engineering.

For abstract, see STAR 07 24.
N69-40936 HC$3.00 MF$0.65

DEVELOPMENT OF AN INTEGRATED LIGHTWEIGHT FLEXIBLE SILICON SOLAR CELL ARRAY QUARTERLY TECHNICAL REPORT, 1 JUL. - 1 OCT. 1969.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Textron Electronics, Inc., Sylmar, Calif. Heliotek Div.
E. L. Ralph, P. M. Stella, and E. F. Zimmerman.
Oct 69, 61p NASA-CR-106379, QTR-1
Contracts NAS7-100, JPL-952560
Prep- Prepared for Jpl

Descriptors: *Arrays, *Prototypes, *Solar cells, *Substrates, Costs, Experimental design, Photoelectric cells, Silicon, Stress concentration, Temperature distribution, Thin films.

For abstract, see STAR 07 24.
N69-40952 HC$3.00 MF$0.65

OBSERVATIONS OF HOTSPOTS AND METALLIC DEPOSITS IN CD S THIN SOLAR CELLS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
J. M. Bozek, M. P. Godlewski, and L. R. Scudder.
10 Oct 69, 17p NASA-TM-X-52697

Descriptors: *Cadmium sulfides, *Degradation, *Photovoltaic effect, *Solar cells, *Thin films, Copper, Deposits, Electrical faults, Grids, Power spectra.

For abstract, see STAR 07 24.
N69-40977 HC$3.00 MF$0.65

STUDY TO DETERMINE AND IMPROVE DESIGN FOR LITHIUM-DOPED SOLAR CELLS QUARTERLY REPORT, 24 JUN. - 30 SEP. 1969.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Radio Corp. of America, Princeton, N. J.
10 Oct 69, 53p NASA-CR-106378, AED-R-3497
Contract NAS7-100
Prep- Prepared for Jpl

Descriptors: *Electrical resistivity, *Hall effect, *Lithium, *Silicon compounds, *Solar cells, Additives, Electrical measurement, Radiation damage, Radiation effects.

For abstract, see STAR 07 24.
N69-41189 HC$3.00 MF$0.65

A STUDY OF GAS SOLUBILITIES AND TRANSPORT PROPERTIES IN FUEL CELL ELECTROLYTES SEMIANNUAL REPORT, 1 MAR. - 31 AUG. 1968.
Florida Univ., Gainesville. Engineering and Industrial Experiment Station.
R. D. Walker, Jr.. 25 Feb 69, 205p NASA-CR-106407, SAR-6
Contract NGR-10-005-022

Descriptors: *Diffusivity, *Electrolytes, *Fuel cells, *Gas density, *Solubility, *Transport properties, *Vapor pressure, Argon, Helium, Hydrogen, Lithium hydroxides, Oxygen, Potassium hydroxides, Water.

For abstract, see STAR 07 24.
N69-41206 HC$3.00 MF$0.65

STUDY AND DETERMINATION OF AN OPTIMUM DESIGN FOR SPACE UTILIZED LITHIUM DOPED SOLAR CELLS QUARTERLY REPORT.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. TRW Systems Group, Redondo Beach, Calif.
R. G. Downing. 15 Oct 69, 15p NASA-CR-106483, QR-1
Contracts NAS7-100, JPL-952554
Prep- Prepared for Jpl

Descriptors: *Additives, *Aerospace environments, *Lithium, *Optimization, *Solar cells, Capacitance, Electron irradiation, Hall effect, Problem solving, Temperature.

For abstract, see STAR 07 24.
N69-41240 HC$3.00 MF$0.65

10C. Energy Storage

PRIMARY ENERGY STORAGE AND THE SUPER FLYWHEEL.
Technical memo.,
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
D. W. Rabenhorst. Sep 69, 73p* Rept no. APL-TG-1081
Contract NOw-62-0604

Descriptors: (*Flywheels, Potential energy), (*Motor generators, Flywheels), (*Passenger vehicles, Flywheels), (*Electric propulsion, Flywheels), Design, Energy conversion, Power, Optimization, Drives, Impellers, Fibers, Composite materials, Performance (Engineering), Clutches, Storage batteries, Efficiency.
Identifiers: *Electric vehicles, Primary energy sources, Automotive engineering, Fiber composites, *Super flywheel energy storage, Urban transporation, Evaulation.

This report describes new flywheel configurations that promise an order of magnitude improvement as energy storage devices. As presently conceived, the energy density has been improved over ten times, with the prospect for additional improvement in performance as the next generation of high strength uniaxial filamentary materials becomes available. This super flywheel is significant in its application to the urban electric vehicle. Instead of only being used to reduce the acceleration power requirements, as has been proposed in many studies, the new flywheel can actually be used as the primary energy source, and batteries can be eliminated altogether. Many other applications are also discussed. (Author)
AD-697 906 HC$3.00 MF$0.65

ANALYSIS AND EVALUATION OF SPACECRAFT BATTERY LIFE TEST DATA (PHASE 2).
Summary rept.,
Naval Ammunition Depot Crane Ind Quality Evaluation Lab
J. R. Kent. 17 Oct 69, 110p Rept no. QE/C-69-665

Descriptors: (*Alkaline cells, Reliability (Electronics)), Nickel, Cadmium, Life expectancy, Predictions, Statistical analysis, Failure (Electronics), Spaceborne.
Identifiers: *Nickel cadmium batteries, *Spacecraft batteries.

The report presents the findings from the mathematical/statistical analysis of data generated by life tests on 660 nickel-cadmium spacecraft battery cells. Three major objectives of the analysis were to: (1) determine the reliability of methods of predicting the useful life of the cells, (2) determine the statistical meaning of data collected during present acceptance testing and whether the acceptance data can be used in making life predictions, and (3) determine if particular failure characteristics or combinations thereof could be related to specific environmental factors. Results of the analysis indicate: (1) about 85% accuracy in predicting the useful life of a cell, (2) the addition of acceptance data to the prediction model is of little value, and (3) failure characteristics were found to be highly correlated with specific environmental factors in several instances. (Author)
AD-697 938 HC$3.00 MF$0.65

VENTED NICKEL-CADMIUM BATTERY ASSEMBLY BB-500 ( )/U.
Final rept. 15 Dec 67-30 May 69,
Eagle-Picher Industries Inc Joplin Mo
William C. Harsch. Nov 69, 130p ECOM-0160-F
Contract DAAB07-68-C-0160
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Storage batteries, *Alkaline cells), (*Power supplies, Portable), Nickel, Cadmium, Design, Manufacturing methods, Military requirements, Acceptability.
Identifiers: *Nickel cadmium batteries.

The report contains the results of this contract which was to design, develop and test the BB-500 ( )/U battery assembly. The BB-500 ( )/U battery assembly is a rechargeable, vented, sintered-plate, nickel-cadmium storage battery. The battery assembly has a military-ruggedized design and consists of twenty (20) individual, series-connected cells in a double-decked configuration. The individual cells are the BB-437 ( )/U batteries and are contained in stainless steel trays, housed in a fiberglass exterior case. The battery assembly is equipped with military equipment connectors to prevent reverse polarity and voltage mis-match connections. As a result of the USAECOM connector arrangement, the BB-500 ( )/U battery assembly is rated at 24 volts and 9 ampere-hours or 12 volts and 18 ampere-hours. (Author)
AD-698 030 HC$3.00 MF$0.65

DEVELOPMENT OF IMPROVED ZINC ELECTRODES FOR SECONDARY BATTERIES FINAL REPORT, JUL. 1968 - JUL. 1969.
Mcdonnell-douglas Astronautics Co., Newport Beach, Calif. Astropower Lab.
A. Himy. Jul 69, 206p NASA-CR-72593, DAC-61001-F
Contract NAS3-11830

Descriptors: *Electrical properties, *Electrodes, *Inorganic compounds, *Zinc oxides, Lead oxides, Metal powder, Performance tests, Sintering, Zirconium oxides.

For abstract, see STAR 07 24.
N69-40063 HC$3.00 MF$0.65

SECONDARY AEROSPACE BATTERIES AND BATTERY MATERIALS - A BIBLIOGRAPHY.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
G. Halpert, and W. H. Webster, Jr.. Aug 69, 157p NASA-TM-X-63707
Contract X-735-69-328

Descriptors: *Bibliographies, *Electric batteries, *Spacecraft power supplies, Abstracts, Electrochemistry, Powder metallurgy, Sintering.

For abstract, see STAR 07 24.
N69-40362 HC$3.00 MF$0.65

HEAT STERILIZABLE AND IMPACT RESISTANT NI- CD BATTERY DEVELOPMENT QUARTERLY REPORT, 1 APR. - 30 JUN. 1969.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Texas Instruments, Inc., Attleboro, Mass. Research and Development Labs.
R. L. Crawford, J. M. Gondusky, P. V. Popat, and E. J. Rubin. 30 Jun 69, 104p NASA-CR-106364
Contracts NAS7-100, JPL-951972
Prep- Prepared for Jpl

Descriptors: *Electrochemical cells, *Heat tolerance, *Impact tests, *Nickel cadmium batteries, *Sterilization, Electrochemistry, Production engineering, Research and development.

For abstract, see STAR 07 24.
N69-40742 HC$3.00 MF$0.65

DEVELOPMENT OF UNIFORM AND PREDICTABLE BATTERY MATERIALS FOR NICKEL-CADMIUM AEROSPACE CELLS QUARTERLY REPORT, 8 FEB. - 7 MAY 1969.
Tyco Labs., Inc., Waltham, Mass.
7 May 69, 27p NASA-CR-106451, QR-4
Contract NAS5-11561

Descriptors: *Nickel, *Nickel cadmium batteries, *Slurries, Coatings, Metal powder, Ratios, Systems engineering.

For abstract, see STAR 07 24.
N69-40923 HC$3.00 MF$0.65

RESEARCH INTO FUNDAMENTAL PHENOMENA ASSOCIATED WITH SPACECRAFT - ELECTROCHEMICAL DEVICES AND CALORIMETRY OF NICKEL-CADMIUM CELLS PROGRESS REPORT, 1 OCT. 1968 - 31 AUG. 1969.
American Univ., Washington, D. C.
R. T. Foley, and G. D. Mitchell. 31 Aug 69, 23p NASA-CR-106392, PR-10
Contract NAS5-10105

Descriptors: *Electrochemistry, *Heat measurement, *Nickel cadmium batteries, *Spacecraft, Fabrication, Flow velocity, Heat transfer, Thermodynamics.

For abstract, see STAR 07 24.
N69-40947 HC$3.00 MF$0.65

11. MATERIALS

11A. Adhesives and Seals

THE FRACTURE ENERGY OF COMPOSITE MATERIALS.
Final rept. 31 Aug-7 Dec 68,
Vermont Univ Burlington
John O. Outwater, and Michael C. Murphy. 1 Nov 69, 29p*
Contract DAAA21-67-C-0041

Descriptors: (*Bonded joints, Epoxy plastics), (*Epoxy plastics, *Adhesion), (*Composite materials, Fracture (Mechanics)), Glass, Glass textiles, Crack propagation, Surface properties, Test methods, Moisture.

A new test method for the measurement of adhesion is described and demonstrated. This method measures the debonding fracture energy between epoxy resin and glass. The effect of moisture on such a joint is shown as are the influences of different glass finishes. Analysis of these data show that the decrease of fracture energy of a joint that results from moisture penetration is directly proportional to the quantity of water present at the joint interface. (Author)
AD-698 031 HC$3.00 MF$0.65

THE DEVELOPMENT OF STRUCTURAL ADHESIVE SYSTEMS SUITABLE FOR USE WITH LIQUID OXYGEN SUMMARY REPORT, 1 MAY - 5 DEC. 1968.
Whittaker Corp., San Diego, Calif.
For primary bibliographic entry see Field 21I.
For abstract, see STAR 07 24.
N69-40782 HC$3.00 MF$0.65

11B. Ceramics, Refractories, and Glasses

FLEXURE THEORY OF STRUCTURAL FIBERGLASS BEAMS.
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13M.
AD-697 916 HC$3.00 MF$0.65

THE EFFECT OF SURFACE FINISHING ON STRUCTURAL-CERAMIC FAILURE.
Interim rept.,
Naval Research Lab Washington D C
Karl R. McKinney, and Charles M. Herbert. 5 Nov 69, 28p* Rept no. NRL-6942

Descriptors: (*Structural parts, Ceramic materials), (*Precision finishing, Ceramic materials), (*Grinding, Degradation), (*Ceramic materials, Fracture (Mechanics)), Alumina, Abrasives, Particle size, Brittleness, Crack propagation, Stresses, Surface properties, Mechanical properties, Glass, Test methods.
Identifiers: Fracture strength, Scratches, Alkali glass.

A relationship between fracture strength and surface finish of brittle nonmetallic materials was examined and related to surface crack theory. An experimental illustration used AlSiMag 614, a 94% pure alumina with a near zero porosity. Specimen disks 3.625+ 0.031 in. in diameter by 0.085+ 0.010 in. thick were prepared, each having a specific surface finish. Testing was done with a biaxial ball and ring test. Observations were made regarding other materials and other abrasive powders. (Author)
AD-697 923 HC$3.00 MF$0.65

A STUDY OF SCIENTIFIC RESEARCH MATERIALS.
Final rept. 27 May 63-27 May 65.
Materials Research Corp Orangeburg N Y

30 Jun 65, 64p Rept no. MRC-514
Contract AF 49 (638)-1241, ARPA Order-421

Descriptors: (*Refractory materials, Synthesis (Chemistry)), (*Ceramic materials, *Electron beam melting), Phase studies, Zone melting, Furnaces, Design, Cadmium sulfides, Zinc sulfides, Infrared windows, Purification, Cadmium, Aluminum, Silicon dioxide, Glass, Intermetallic compounds, Carbides.
Identifiers: Aluminum nickel, Nickel intermetallics, Aluminum intermetallics.

The report contains three sections: (1) Abstracts of papers published: Parameters pertinent to the electron beam zone refinement of refractory metals; Age-hardening in a gold-nickel alloy; The preparation and properties of the intermediate phase based on the compound TiCo; The effect of ultra-high vacuum electron beam zone refining on the purification of metals; The relation between vacuum and purity in float-zone melting of refractory metals. (2) Completed work to be submitted for publication: Electron beam heating of ceramic materials; Phase relationships in the Ti-Co system. (3) Unpublished work: Preparation of volatile compounds; Preparation of a cadmium-alumina-silica glass; Characterization by field ion microscopy; Electrotransport as a means of purification; Characterization of Ni3Al. (Author)
AD-698 001 HC$3.00 MF$0.65

STUDY OF SPRAYING BORIDES AND NITRIDES BY PLASMA GUN. PART II. CHARACTERISTICS OF THE SPECIMENS OBTAINED (Etude de la Projection des Borures et Nitrures au Chalumeau a Plasma),
California Univ., Berkeley. Lawrence Radiation Lab.
G. Bentz, G. Provost, and C. Urban. Oct 69, 52p
UCRL-Trans-10395
Trans. of Societe Francaise de Ceramique. Bulletin, n81 p23-43 Oct/Dec 68, by B. Haro. PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Refractory coatings, *Sprays), (*Nitrides, Refractory coatings), (*Borides, Refractory coatings), Plasma medium, X-ray diffraction analysis, Phase diagrams, Thermal expansion, Mechanical properties, Molybdenum compounds, Lanthanum compounds, Titanium compounds, Zirconium compounds, Chromium compounds, France.
Identifiers: *Plasma spraying, Sprayed coatings, Chromium borides, Molybdenum borides, Lanthanum borides, Titanium nitrides, Zirconium nitride.

Discussed are the refractory coatings resulting from the spraying of metal borides and nitrides by a plasma gun. The mechanical, physical, and structural properties of the following compounds are discussed: Chromium borides (CrB, CrB2); Molybdenum borides (MoB, Mo2B5); Lanthanum boride (LiB6); Titanium nitride (TiN); Zirconium nitride (ZrN); and Tantalum nitride (TaN).
PB-188 142T HC$3.00 MF$0.65

USER'S GUIDE FOR THE COMPUTER PROGRAM DESCRIBED IN TAM REPORT NO. 680 'DETERMINATION OF VOLUME CHANGE STRESSES IN PLAIN AND REINFORCED CONCRETE USING FINITE ELEMENT ANALYSIS',
Illinois Univ., Urbana. Dept. of Theoretical and Applied Mechanics.
For primary bibliographic entry see Field 9B.
PB-188 188 HC$3.00 MF$0.65

PREPARATION OF HIGH-PURITY BORON NITRIDE POWDER,
Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
For primary bibliographic entry see Field 7B.
For abstract, see NSA 23 23.
Y-1688 HC$3.00 MF$0.65

11C. Coating, Colorants, and Finishes

ELECTRON MICROSCOPIC INVESTIGATION OF THIN METAL-POLYMER COATINGS AND FILMS,
Foreign Technology Div Wright-Patterson AFB Ohio
A. M. Krasovskii, and V. A. Belyi. 8 Sep 69, 8p
Rept no. FTD-HT-23-428-69
Edited trans. of Akademiya Navuk BSSR, Minsk. Doklady, v12 n12 p1097-1099 1968, by D. Koolbeck.

Descriptors: (*Microminiaturization (Electronics), *Coatings), (*Films, Microstructure), Organic compounds, Nylon coatings, Metal films, Electron microscopy, Vacuum apparatus, Vapor plating, Substrates, Radio equipment, USSR.
Identifiers: *Organometallic compounds, Nylon 6, Translations, Thin films.

A comparative study was made of the structure of thin films deposited in vacuum by simultaneous vaporization of certain metals with polycaproamide and of the same metals alone. The purpose of the study was to evaluate the process of formation of composite coatings which may solve certain problems of electronics and radio communications. Thin films were deposited on collodion or quartz film substrates by high-speed vaporization in vacuum of given amounts of the components. The composite films obtained may be divided into two groups according to the observed electron microscopic refraction patterns and electron micrographs. The first group include the films obtained with polycaproamide and sodium, potassium, or silver. The composite films of the second group differed sharply in structure from the films of their metallic components, such as iron, aluminum, or lead. The composite material displayed an amorphous structure in contrast to the crystalline structure of pure metallic films. (Author)
AD-697 918 HC$3.00 MF$0.65

DIFFUSION SILICONIZING OF MOLYBDENUM, TUNGSTEN, AND NIOBIUM IN MOLTEN SALTS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13H.
AD-697 919 HC$3.00 MF$0.65

CATHODIC REDUCTION OF CUPROUS OXIDE IN VINYL ANTIFOULING PAINTS,
Defence Research Establishment Pacific Victoria (British Columbia)
For primary bibliographic entry see Field 13H.
AD-698 013

USE OF SODIUM ALUMOMETHYL SILICONATE FOR FABRIC FINISHING,
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 11E.
AD-698 085 HC$3.00 MF$0.65

ALTERATION OF THE PENETRABILITY OF SKIN.
Lever Bros. Co., Edgewater, N.J. Research and Development Div.
For primary bibliographic entry see Field 6P.
AD-816 303 HC$3.00 MF$0.65

EFFECTIVENESS OF ZINC COATING ON REINFORCING STEEL IN CONCRETE EXPOSED TO A MARINE ENVIRONMENT.
Naval Civil Engineering Lab., Port Hueneme, Calif.
For primary bibliographic entry see Field 11D.
AD-856 906 HC$3.00 MF$0.65

NATURAL WEATHERING OF MINERAL STABILIZED ASPHALT COATINGS ON ORGANIC FELT.
National Bureau of Standards, Washington, D.C. Building Research Div.
For primary bibliographic entry see Field 13C.
NBS-BSS-24 HC$0.30 MF$0.65

MATERIALS FOR SPACE APPLICATION.
British Aircraft Corp. (Operating) Ltd., Bristol (England). Guided Weapons Div.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 07 24.
N69-40118 HC$3.00 MF$0.65

TRANSMISSION EFFECTS ON PLASTIC FILMS IRRADIATED WITH ULTRAVIOLET LIGHT, ELECTRONS, AND PROTONS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
E. Anagnostou, and A. E. Spakowski. Oct 69, 12p
NASA-TM-X-1905
Contract 120-33

Descriptors: *Polymeric films, *Transmissivity, *Ultraviolet radiation, *Vacuum effects, Solar cells, Wavelengths.

For abstract, see STAR 07 24.
N69-40339 HC$3.00 MF$0.65

USE OF A THIN-FILM EVAPORATOR FOR BITUMEN COATING OF RADIOACTIVE CONCENTRATES.
Commissariat A L Energie Atomique, Chusclan (France). Centre de Production de Plutonium.
For primary bibliographic entry see Field 18G.
For abstract, see STAR 07 24.
N69-40574 HC$3.00 MF$0.65

COATINGS FOR ADVANCED THRUST CHAMBERS FINAL REPORT.
Aerojet-general Corp., El Monte, Calif.
W. J. Lewis. 1968, 105p NASA-CR-72604
Contract NAS3-11185

Descriptors: *Liquid rocket propellants, *Protective coatings, *Thrust chambers, Arc spraying, Plasma spraying, Stress analysis, Thermal insulation, Thermochemical properties.

For abstract, see STAR 07 24.
N69-40933 HC$3.00 MF$0.65

ROADMAKING MATERIALS AND PAVEMENT DESIGN IN TROPICAL AND SUB-TROPICAL COUNTRIES,
Road Research Lab., Crowthorne (England).

For primary bibliographic entry see Field 13B.
PB-188 158 HC$3.00 MF$0.65

11D. Composite Materials

AEROSPACE-AFML CONFERENCE ON NDT OF PLASTIC/COMPOSITE STRUCTURES, DAYTON, OHIO, MARCH 18-20, 1969.
Air Force Materials Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 14B.
AD-697 956 HC$3.00 MF$0.65

INTERFACES IN FIBER-REINFORCED METAL MATRIX COMPOSITES. A STATE-OF-THE-ARTS SURVEY.
Research rept.,
General Dynamics/Fort Worth Tex Fort Worth Div
Juliet H. Ashton. 17 Jul 67, 78p Rept no. ERR-FW-529

Descriptors: (*Composite materials, Interfaces), State-of-the-art reviews, Reinforcing materials, Fibers, Whiskers (Crystals), Boron, Silicon carbides, Sapphires, Filaments, Metals, Compatibility, Nitrides, Compacting.

A state-of-the-art investigation of interfacial composition in high-modulus, high-strength, low-density fiber- and whisker-reinforced metal matrix composite materials is conducted. Primary emphasis is placed on boron, silicon carbide, and sapphire reinforcing materials. Kinetic and thermodynamic compatibility data are compiled and several filament-metal matrix material combinations are defined for use in high-energy-rate dynamic compaction fabrication. General composite materials evaluation methods are briefly described. (Author)
AD-697 995 HC$3.00 MF$0.65

THE FRACTURE ENERGY OF COMPOSITE MATERIALS.
Vermont Univ Burlington
For primary bibliographic entry see Field 11A.
AD-698 031 HC$3.00 MF$0.65

EFFECTIVENESS OF ZINC COATING ON REINFORCING STEEL IN CONCRETE EXPOSED TO A MARINE ENVIRONMENT.
Technical note,
Naval Civil Engineering Lab., Port Hueneme, Calif.
Donald F. Griffin. Jul 69, 47p* NCEL-TN-1032
Distribution Limitation now Removed.

Descriptors: (*Steel, *Zinc coatings), (*Reinforced concrete, Performance (Engineering)), Salt spray tests, Reinforcing materials, Effectiveness, Corrosion inhibition, Cracks, Degradation.
Identifiers: Reinforcing steels, Air entrained concretes.

The investigation was made to determine whether or not galvanized steel reinforcement is more sutiable than non-galvanized steel reinforcement in concrete exposed to a marine environment. The criterion of comparative suitability is time-dependent cracking of reinforced concrete walls caused by expansive forces resulting from build-up of corrosion products. (Author)
AD-856 906 HC$3.00 MF$0.65

ELABORATION OF FIBER-REINFORCED METALLIC MATERIALS.
Elaboration des Materiaux Metalliques Renforces Par des Fibres
Commissariat A L Energie Atomique, Grenoble (France). Centre D Etudes Nucleaires.
J.-M. Martin. Aug 69, 24p CEA-R-3832
Lang- in French, English Summary

Descriptors: *Composite materials, *Fabrication, *Reinforcing fibers, *Structural stability, Adhesion, Bibliographies, Fiber strength, Metals, Solidification.

For abstract, see STAR 07 24.
N69-40587 HC$3.00 MF$0.65

CRITICAL ANALYSIS OF ACCUMULATED EXPERIMENTAL DATA ON FILAMENT-REINFORCED METAL MATRIC COMPOSITES.
General Technologies Corp., Reston, Va.
For primary bibliographic entry see Field 11F.
For abstract, see STAR 07 24.
N69-41247 HC$3.00 MF$0.65

AN INVESTIGATION OF CERTAIN PHYSICAL AND MECHANICAL PROPERTIES OF WOOD-PLASTIC COMBINATIONS,
North Carolina State Univ., Raleigh.
Eric Ellwood, Robert Gilmore, James A. Merrill, and W. Kenneth Poole. May 69, 159p* RTI-2513-T-13
Contract AT (40-1)-2513
Prepared in cooperation with Research Triangle Inst., Durham, N.C.

Descriptors: (*Composite materials, *Wood), (*Plastics, Composite materials), (*Polymerization, Radiation chemistry), Physical properties, Radiation damage.

For abstract, see NSA 23 23.
ORO-638 HC$3.00 MF$0.65

PROTECTION OF PRESTRESSING STEELS. TOPIC II. NOTES ON SOME PROBLEMS OF PRESTRESSED CONCRETE.
Oak Ridge National Lab., Tenn.
1969, 315P ORNL-tr-2173
Trans. of Institut Technique du Batiment et des Travaux Publics, Paris. Annales (France) n255/256 p486-636 Mar/Apr 69.

Descriptors: (*Reinforced concrete, Steel), (*Steel, *Corrosion inhibition), Corrosion, Grout, Electrolysis, Salts, Zinc coatings, Epoxy plastics, Force (Mechanics), Deformation, Stresses, Compressive properties, Tensile properties, France.
Identifiers: *Prestressing steels, *Prestressed concrete, Translations.

Contents: Observations on some problems of prestressed concrete; Experimental studies on the risks of corrosion of hard steels; Injection grouting improved with epoxy resins for prestressing conduits; Test results obtained with cement-base injection groutings; Examination of the 'Study Summaries' of the durability commission of the FIP; Tension losses by friction of prestressing wires and cables; Report of F. Dumas on the relaxation of prestressing steels; Permissible limit strengths of concretes used in prestressed construction.
PB-188 151T HC$3.00 MF$0.65

STUDY OF COMPRESSIVE STRENGTHS OF PORTLAND CEMENT CONCRETE TEST CYLINDERS.
Maine State Highway Commission. Materials and Research Div.
For primary bibliographic entry see Field 13M.
PB-188 186 HC$3.00 MF$0.65

11E. Fibers and Textiles

USE OF SODIUM ALUMOMETHYL SILICONATE FOR FABRIC FINISHING,
Army Foreign Science and Technology Center Washington D C
R. Z. Dushkina. 14 Nov 69, 9p Rept no. FSTC-HT-23-142-70
Trans. of Tekstilnaya Promyshlennost (USSR) v28 n9 p57-59 1968.

Descriptors: (*Textiles, *Surface-active substances), (*Silicates, Surface-active substances), (*Moistureproofing, Textiles), Silicon coatings, Aluminum compounds, Synthesis (Chemistry), Cotton, Viscose, Cellulose acetates, Dacron, Woolen textiles, USSR.
Identifiers: *Aluminosilicates, Sodium methyl aluminosi licates, Translations.

A new silicone preparation, sodium alumomethyl siliconate (AMSR), was tested for the finishing of fabrics from various fibers for the purpose of giving them hydrophobic properties. Results of tests reveal that an AMSR preparation imparts hydrophobic properties to fabrics of different raw material composition (cotton, viscose and acetate fibers, dacron, wool) and in water-repelling properties is the equal of such well-known hydrophobic agents as chromolan and primenit VS. (Author)
AD-698 085 HC$3.00 MF$0.65

SCIENCE PICTORIAL. NUMBER 1, 1964 (SELECTED ARTICLES).
Foreign Technology Div Wright-Patterson AFB Ohio

8 Aug 69, 35p Rept no. FTD-HT-23-1298-68
Edited trans. of K'o Hsueh Hua Pao (Mainland China) n1 p3-11 1964.

Descriptors: (*Fibers, Chemical properties), (*Laundering, Fibers), Manufacturing methods, China.
Identifiers: Translations.

Contents: Various aspects of chemical fibers; Free discussion on chemical fibers; Discussion in writing information on using chemical fibers. (Author)
AD-698 114 HC$3.00 MF$0.65

11F. Metallurgy and Metallography

QUARTERLY BULLETIN OF THE DIVISION OF MECHANICAL ENGINEERING AND THE NATIONAL AERONAUTICAL ESTABLISHMENT.
National Research Council of Canada Ottawa (Ontario) Div of Mechanical Engineering
For primary bibliographic entry see Field 1C.
AD-697 892 HC$3.00 MF$0.65

SURFACE INTERACTION BETWEEN MOLTEN OXIDES AND REFRACTORY METALS,
Foreign Technology Div Wright-Patterson AFB Ohio
B. S. Mitin, and V. Ya. Levin. 23 Sep 69, 12p Rept no. FTD-HT-23-253-69 (JPRS)
Trans. of Seminar po Zharostoikim Pokrytiyam (3rd) Leningrad, 1966. Temperaturoistoichivye Zashchitnye Pokrytiya; Trudy (Seminar on Heat-Resistant Coatings (3rd) Leningrad, 1966. Temperature-Stable Protective Coatings; Transactions), Leningrad, 1968 p310-316.

Descriptors: (*Refractory metals, Wetting), (*Oxides, Surface-active substances), Alumina, Titanium compounds, Tantalum compounds, Tungsten compounds, Niobium compounds, Molybdenum compounds, Vanadium compounds, Surface properties, Interactions, Dynamics, USSR.
Identifiers: Translations.

The results of an experimental investigation of the processes of the wetting of refractory metals by molten oxides and of the spreading of molten oxides over the surfaces of refractory metals are presented. It is shown that the wetting and spreading of molten oxides over the surface of refractory metals is determined by the intensity of the chemical reaction occurring at the interface. The highest spreading rate is observed for the least chemically active metal. These findings confirm that chemical interaction rather than Van der Waals or Coulomb forces plays the dominant role in the processes of spreading in oxide-metal systems.
AD-697 915 HC$3.00 MF$0.65

HEAVY SECTION STEEL TOUGHNESS CHARACTERIZATION PROGRESS REPORT ENDING 31 AUGUST 1969.
Memorandum rept.,
Naval Research Lab Washington D C
Frank J. Loss. 15 Sep 69, 21p Rept no. NRL-MR-2041

Descriptors: (*Steel, Fracture (Mechanics)), Metal plates, Toughness, Thickness.
Identifiers: Steel A-533, Tear tests.

An investigation was made of the fracture toughness of thick-section steels as influenced by mechanical constraint and through-thickness metallurgical variations. The primary tool used in these research studies is the dynamic tear (DT) test. This progress report includes the following: (1) toughness variation through the thickness of HSST plate 03, (2) comparison of toughness of 5/8-in. DT specimens (in the RW and WR orientations) cut from HSST plate 02, and (3) thick section DT tests from HSST plate 01. (Author)
AD-697 920 HC$3.00 MF$0.65

THE TEMPERATURE DEPENDENCE OF SHOCK WAVE PROPAGATION IN BRASS AND ALUMINUM,
Naval Ordnance Lab White Oak Md
For primary bibliographic entry see Field 20L.
AD-697 931 HC$3.00 MF$0.65

CAST ALLOYS. VOLUME 2,
Foreign Technology Div Wright-Patterson AFB Ohio
L. I. Levi, and S. K. Kantenik. 13 Aug 69, 173p
Rept no. FTD-MT-24-461-68-Vol-2
Edited machine trans. of mono. Volume 2, Liteinye Splavy, Moscow, 1967 p1-435. See also Volume 1, AD-698 103.

Descriptors: (*Casting alloys, *Textbooks), Casting, Copper alloys, Nickel alloys, Cobalt alloys, Refractory metal alloys, Aluminum alloys, Magnesium alloys, Bearings, USSR.
Identifiers: Translations.

Contents: Copper and its alloys; Nickel and its alloys; Cobalt and its alloys; Castings from refractory and certain other metals and alloys; Aluminum and its alloys; Magnesium and its alloys, Bearing alloys; and Casting from nonmetallic materials.
AD-697 994 HC$3.00 MF$0.65

MICROSCOPIC MOVIE OF FATIGUE INDUCED CRACK INITIATION AND PROPAGATION,
Iowa Univ Iowa City Dept of Mechanical Engineering
R. E. Duncan, and R. I. Stephens. Aug 69, 9p Rept no. THEMIS-UI-13
Contract DAAF03-69-C-0014
Report on Vibration and Stability of Military and other Complex Vehicular Systems.

Descriptors: (*Metallography, Steel), (*Steel, Crack propagation), (*Training films, Reviews), Fatigue (Mechanics), Cracks, Fracture (Mechanics), Microscopy, Microstructure, Grain structures (Metallurgy), Grain boundaries.
Identifiers: Crack initiation, Carbon steels, Themis project.

A motion picture taken through an optical microscope was made in an attempt to better understand the mechanisms of fatigue crack initiation, propagation and fracture in metals. The primary usage of the movie is that of a visual educational training aid. The movie qualitatively compares crack initiation and propagation in a low carbon steel under the following conditions: (a) low cycle fatigue (less than 50,000 cycles to failure) photographed at 16X, 150X, and 300X magnification; (b) high cycle fatigue (about 1 million cycles to failure) photographed at 300X magnification. Under these conditions the movie shows the interaction of slip lines, slip bands, crack tip, grains and grain boundaries under cyclic conditions. (Author)
AD-698 017 HC$3.00 MF$0.65

A TECHNIQUE FOR PREPARING AND MOUNTING THIN NICKEL FOILS,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
D. L. Carr. 24 Feb 69, 1p
Availability: Pub. in The Review of Scientific Instruments, v40 n7 p965-966 Jul 69. No copies furnished.

Descriptors: (*Foils, *Nickel), Preparation, Manufacturing methods.

The report describes a method for removing a copper layer from the foils and then mounting the foils onto aperture plates.
AD-698 058

DIFFUSION WELDING IN A VACUUM,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13H.
AD-698 097 HC$3.00 MF$0.65

CAST ALLOYS. VOLUME I,
Foreign Technology Div Wright-Patterson AFB Ohio
L. I. Levi, and S. K. Kantenik. 13 Aug 69, 398p
Rept no. FTD-MT-24-461-68-Vol-1
Edited machine trans. of mono. Volume 1, Liteinye Splavy, Moscow, 1967 p1-435. See also Volume 2, AD-697 994.

Descriptors: (*Casting alloys, *Textbooks), Casting, Production, Iron alloys, Castings, Melting, Heat treatment, USSR.
Identifiers: Translations, *Cast iron.

The book reviews in detail the production of casting alloys used in machine building, instrumentation, chemical industry and rocket engineering. Physical-metallurgical basic principles of producing casting alloys and the cast alloy properties are discussed in special chapters.
AD-698 103 HC$3.00 MF$0.65

AIRCRAFT METALS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 1D.
AD-698 107 HC$3.00 MF$0.65

OXIDATION AND PROTECTION OF BERYLLIUM,
Foreign Technology Div Wright-Patterson AFB Ohio
I. I. Papirov. 13 Aug 69, 123p* Rept no. FTD-HT-23-110-69
Edited trans. of mono. Okislenie i Zashchita Berilliya, Moscow, 1968 p1-120.

Descriptors: (*Beryllium, Oxidation), (*Corrosion inhibition, Beryllium), Corrosion resistance, Beryllium alloys, Intermetallic compounds, Beryllium oxides, Films, Coatings, Reaction kinetics, Radiation damage, Moisture, USSR.
Identifiers: Beryllides, Translations.

The book presents the results of experimental research on the corrosion and protection of beryllium in various gaseous media within a wide range of temperatures and pressures. The results of kinetic, optical, electron-microscopic, x-ray, and electronographic examinations are given. The effect of various factors (purity, moisture of the gaseous medium, surface treatment, etc.) on the oxidation kinetics are pointed out. The possibility of improving the anticorrosion properties of metal is examined. Considerable attention is given to a description of the properties of corrosion-resistant beryllium alloys and various beryllides. Data on the oxidation mechanism of pure metals and alloys are given and the theory of beryllium oxidation is described. (Author)
AD-698 109 HC$3.00 MF$0.65

THE STRUCTURE, MECHANICAL PROPERTIES AND DEFORMATION BEHAVIOR OF Ti-Al AND Ti-Al-X ALLOYS,
Boeing Scientific Research Labs Seattle Wash
J. C. Williams, and M. J. Blackburn. Sep 69, 31p*
Rept no. D1-82-0928
Prepared in cooperation with North American Rockwell Corp., Thousand Oaks, Calif.

Descriptors: (*Titanium alloys, Metallography), Aluminum alloys, Gallium alloys, Tin alloys, Indium alloys, Lead alloys, Phase studies, Dispersion hardening, Microstructure, Dislocations, Deformation, Phase diagrams, Mechanical properties.

Strengthening due to the precipitation of the ordered alpha sub 2 phase (based on Ti3X) was studied in binary and ternary Ti-Al-X3 (where X= Sn, Ga, In or Pb) alloys. The observed strengthening can be separated into two principal components; one due to the dislocation/ordered particle interaction and the other due to dislocation/precipitate stress field interactions. The former of these appears more important in some cases, e.g., Ti-Al-Sn alloys; whereas the latter appears to predominate in other cases, e.g., Ti-Al-Ga alloys. The brittleness of single phase Ti3Al was shown to be related to slip morphology and the decreased extent of<11 -2 3> glide with increasing Al content. The marked improvement in strength and ductility of the Ti3 (Al0.5Ga0.5) and Ti3 (Al0.25Ga0.75) compounds results from the phase separation into alpha sub 2+ Ti2Ga with an accompanying change in slip morphology and an increase in the extent of<11 -2 3> glide. (Author)
AD-698 173 HC$3.00 MF$0.65

RESEARCH AND DEVELOPMENT OF VACUUM FOIL-TYPE INSULATION FOR RADIOISOTOPE POWER SYSTEMS.
Thermo Electron Corp., Waltham, Mass.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 23 23.
ALO-3634-13 HC$3.00 MF$0.65

CORROSION OF VANADIUM AND VANADIUM-BASE ALLOYS IN SODIUM,
Argonne National Lab., Ill.
W. E. Ruther. May 69, 39p
Contract W-31-109-eng-38

Descriptors: (*Reactor materials, Vanadium alloys), (*Vanadium alloys, Corrosion), Vanadium alloys, Sodium.

For abstract, see NSA 23 23.
ANL-7505 HC$3.00 MF$0.65

CORRELATION OF DISLOCATION SUBSTRUCTURE WITH CREEP PROPERTIES IN REFRACTORY METALS.
Final rept.,
Battelle Memorial Inst., Columbus, Ohio.
A. H. Clauer, B. A. Wilcox, and J. P. Hirth. 17 Jul 68, 317p
Contract W-7405-eng-92

Descriptors: (*Refractory metals, *Creep), Crystal lattice defects.

For abstract, see NSA 23 23.
BMI-X-517 HC$3.00 MF$0.65

EFFECT OF STRAIN RATE ON MECHANICAL PROPERTIES OF AUSTENITIC STAINLESS STEELS,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
R. G. Hoagland. Sep 69, 21p
Contract AT (45-1)-1830

Descriptors: (*Stainless steel, Mechanical properties), Reactor materials, Deformation.

For abstract, see NSA 23 23.
BNWL-1105 HC$3.00 MF$0.65

PERFORMANCE OF TITANIUM AND NIOBIUM ELECTRODES IN AN ELECTROLYTIC DISSOLVER FOR NUCLEAR FUELS,
Idaho Nuclear Corp., Idaho Falls.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
IN-1191 HC$3.00 MF$0.65

THE EFFECT OF STRESS ON THE LOW-TEMPERATURE OXIDATION OF NIOBIUM.
Doctoral thesis,
Ames Lab., Iowa.
Lawrence John Weirick. May 69, 240p
Contract W-7405-eng-82
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Niobium, Oxidation), Metal films, Stress corrosion, Theses.

For abstract, see NSA 23 23.
IS-T-304 HC$3.00 MF$0.65

CORROSION OF A LOW ALLOY STEEL IN A SIMULATED LIQUID-METAL-FUEL REACTOR MIXTURE.
Ames Lab., Iowa.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
IS-T-318 HC$3.00 MF$0.65

THE EFFECTS OF NEUTRON IRRADIATION UPON THE STRENGTH AND DUCTILITY OF VANADIUM,
Ames Lab., Iowa.
G. R. Smolik, and C. W. Chen. May 69, 59p
Contract W-7405-eng-82

Descriptors: (*Vanadium, *Radiation damage), Neutrons, Ductility.

For abstract, see NSA 23 23.
IS-2127 HC$3.00 MF$0.65

BIBLIOGRAPHY ON THE HIGH TEMPERATURE CHEMISTRY AND PHYSICS OF MATERIALS,
National Bureau of Standards, Washington, D.C. Inst. for Materials Research.
For primary bibliographic entry see Field 7D.
NBS-SP-315-3 HC$1.00 MF$0.65

X-RAY STUDY OF THE PRECIPITATION OF HYDROGEN IN VANADIUM,
Cornell Univ., Ithaca, N.Y. Materials Science Center.
A. Bonfiglioli, and B. W. Batterman. 20 Aug 69, 14p

Descriptors: (*Vanadium, Crystal lattice defects), (*Hydrogen, Impurities), X-ray diffraction analysis, Single crystals.

For abstract, see NSA 23 23.
NYO-3789-8 HC$3.00 MF$0.65

SOLUBILITIES OF MOLYBDENUM AND TUNGSTEN IN LIQUID POTASSIUM.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
S. Stecura. Oct 69, 14p NASA-TN-D-5504
Contract 129-03

Descriptors: *Liquid potassium, *Molybdenum, *Solubility, *Tungsten, Chemical reactions, Liquid metals, Reaction kinetics.

For abstract, see STAR 07 24.
N69-40053 HC$3.00 MF$0.65

RESEARCH ON METALLURGICAL CHARACTERISTICS AND PERFORMANCE OF MATERIALS USED FOR SLIDING ELECTRICAL CONTACTS SUMMARY REPORT, 1 MAY 1968 - 30 APR. 1969.
Battelle Memorial Inst., Columbus, Ohio.
For primary bibliographic entry see Field 9A.
For abstract, see STAR 07 24.
N69-40057 HC$3.00 MF$0.65

MODIFIED EUTECTIC ALLOYS FOR HIGH TEMPERATURE SERVICE FINAL REPORT, JUL. 1967 - APR. 1969.
Case Western Reserve Univ., Cleveland, Ohio. Div. of Metallurgy and Material Science.
M. U. Ordillas, Jr., and J. F. Wallace. Apr 69, 115p NASA-CR-106306
Contract NGR-36-003-033

Descriptors: *Chromium alloys, *Cobalt alloys, *Eutectic alloys, *Refractory metal alloys, *Tungsten alloys, Casting, Cold working, Forming techniques, High strength alloys, Metal working.

For abstract, see STAR 07 24.
N69-40123 HC$3.00 MF$0.65

HOT-SALT STRESS-CORROSION OF A TITANIUM ALLOY UNDER A SIMULATED TURBINE-ENGINE COMPRESSOR ENVIRONMENT.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
H. R. Gray, and J. R. Johnston. Oct 69, 35p NASA-TN-D-5510
Contract 129-03

Descriptors: *Environment simulation, *Halides, *High temperature, *Stress corrosion, *Titanium alloys, *Turbocompressors, Embrittlement, Environmental tests, Gas turbine engines.

For abstract, see STAR 07 24.
N69-40242 HC$3.00 MF$0.65

THE INFLUENCE OF HYDROSTATIC PRESSURE ON DIFFUSION IN METALS HAVING A CUBIC STRUCTURE.
Commissariat A L Energie Atomique, Saclay (France). Centre D Etudes Nucleaires.
For primary bibliographic entry see Field 20L.
For abstract, see STAR 07 24.
N69-40511 HC$3.00 MF$0.65

STUDY OF INCLUSION COUNTING BY THE COINCIDENCE METHOD.
Etude Du Comptage des Inclusions Par La Methode des Coincidences
Commissariat A L Energie Atomique, Saclay (France). Centre D Etudes Nucleaires.
M. Jean. Jul 69, 31p CEA-R-3858
Lang- in French, English Summary

Descriptors: *Coincidence circuits, *Inclusions, *Steels, Counting, Microscopy, Reticles, Size determination.

For abstract, see STAR 07 24.
N69-40588 HC$3.00 MF$0.65

THE PREPARATION AND TENSILE PROPERTIES OF CHROMIUM WIRE.
Aeronautical Research Labs., Melbourne (Australia).
F. P. Bullen, F. Henderson, and H. L. Wain. Mar 69, 23p ARL/MET-64

Descriptors: *Annealing, *Chromium, *Microstructure, *Tensile properties, *Wire, Crack propagation, Stress relieving, Swaging, Temperature effects.

For abstract, see STAR 07 24.
N69-40616 HC$3.00 MF$0.65

SIXTH PLANSEE SEMINAR PREPRINTS, VOLUME 1.
1968, 623p
Lang- Partly in English, Partly in German, Partly in French Conf- Presented At Reutte, Austria, 24-28 Jun. 1968 Subm- Submitted for Publication

Descriptors: *Conferences, *Heat resistant alloys, *Mechanical properties, *Powder metallurgy, *Production engineering, *Refractory metal alloys, *Refractory metals, Corrosion resistance, Melting points, Metal matrix composites, Phase diagrams, Refractory materials.

For abstract, see STAR 07 24.
N69-40651 HC$3.00 MF$0.65

SIXTH PLANSEE SEMINAR PREPRINTS, VOLUME 2.
1968, 535p
Lang- Partly in English, Partly in German, Partly in French Conf- Presented At Reutte, Austria, 24-28 Jun. 1968 Subm- Submitted for Publication

Descriptors: *Conferences, *Metal matrix composites, *Metal powder, *Recrystallization, *Reduction (chemistry), *Refractory metals, High temperature, Melting points, Particle diffusion, Phase diagrams, Powder metallurgy, Production engineering, Purification, Reaction kinetics, Vapor deposition.

For abstract, see STAR 07 24.
N69-40674 HC$3.00 MF$0.65

SIXTH PLANSEE SEMINAR PREPRINTS, VOLUME 3.
1968, 286p
Lang- Partly in English, Partly in German, Partly in French Conf- Presented At Reutte, Austria, 24-28 Jun. 1968 Subm- Submitted for Publication

Descriptors: *Conferences, *Heat resistant alloys, *Mechanical properties, *Melting points, *Production engineering, *Refractory materials, *Refractory metal alloys, Barrier layers, Chemical bonds, Chemical engineering, Corrosion resistance, Powder metallurgy, Purification, Reduction (chemistry).

For abstract, see STAR 07 24.
N69-40692 HC$3.00 MF$0.65

CAVITATION DAMAGE IN LIQUID METALS - POTASSIUM STUDIES FINAL REPORT.
Hydronautics, Inc., Laurel, Md.
H. S. Preiser, S. L. Rudy, and A. Thiruvengadam. Apr 69, 75p NASA-CR-106481, TR-607
Contract NAS3-8506

Descriptors: *Cavitation flow, *Erosion, *High temperature, *Liquid potassium, Heat transfer, Low pressure, Rankine cycle, Stresses.

For abstract, see STAR 07 24.
N69-41015 HC$3.00 MF$0.65

BRAZE ALLOY INVESTIGATION.
Airesearch Mfg. Co., Los Angeles, Calif.
L. F. Jilly. 27 May 69, 11p NASA-CR-66845, AP-68-3813
Contract NAS1-6666

Descriptors: *Construction materials, *Hypersonic speed, *Research vehicles, *Rocket engines, Composition (property), Gold alloys, Mechanical properties, Nickel alloys, Palladium alloys, Rupturing, Shells (structural forms).

For abstract, see STAR 07 24.
N69-41061 HC$3.00 MF$0.65

CRITICAL ANALYSIS OF ACCUMULATED EXPERIMENTAL DATA ON FILAMENT-REINFORCED METAL MATRIC COMPOSITES.
General Technologies Corp., Reston, Va.
J. A. Alexander, R. G. Shaver, and J. C. Withers.
Jun 69, 145p NASA-CR-106490
Contract NASW-1779

Descriptors: *Composite materials, *Metals, *Reinforcing fibers, Creep rupture strength, Fabrication, Matrix methods, Metal bonding, Tensile strength.

For abstract, see STAR 07 24.
N69-41247 HC$3.00 MF$0.65

COMPARATIVE CREEP-RUPTURE PROPERTIES OF W-25 PERCENT Re CONSOLIDATED BY ARC MELTING AND POWER METALLURGY TECHNIQUES,
Oak Ridge National Lab., Tenn.
R. L. Stephenson. Sep 69, 15p
Contract W-7405-eng-26
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Tungsten alloys, Mechanical properties), Powder metallurgy, Rhenium alloys, Arc melting.
Identifiers: Tungsten alloy 25 Re.

For abstract, see NSA 23 23.
ORNL-TM-2651 HC$3.00 MF$0.65

EFFECT OF NICKEL, SILICON, AND MOLYBDENUM ON THE CORROSION OF AUSTENTIC IRON-CHROMIUM-NICKEL ALLOYS IN SUPERHEATED STEAM,
Oak Ridge National Lab., Tenn.
H. Coriou, L. Grall, C. Mahieu, M. Pelras, and A. Perez. 1969, 9p
Trans. of Revue de Metallurgie. Memoires Scientifiques (France) v65 n9 p643-650 1968, by R. Gregg Mansfield.

Descriptors: (*Stainless steel, Corrosion), Steam, Reactor materials, France.
Identifiers: Translations.

For abstract, see NSA 23 23.
ORNL-tr-2190 HC$3.00 MF$0.65

DISSOCIATION PRESSURE OF BISMUTH IN THE SYSTEM: BISMUTH-THORIUM,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 23 23.
ORNL-tr-2218 HC$3.00 MF$0.65

CORROSION BY POLLUTED SEA WATER AND ITS PREVENTION (EFFECT ON COPPER ALLOYS),
Oak Ridge National Lab., Tenn.
Kyoichi Ikemura. 1969, 18p ORNL-tr-2237
Trans. of Boshoku Gijutsu (Japan) v11 n6 p250-255 1962.

Descriptors: (*Copper alloys, Corrosion inhibition), (*Corrosion, *Sea water), Water pollution, Corrosion, Fouling, Protective treatments, Surface-active substances, Amines, Bacteria, Iron compounds, Sulfates, Cleaning, Japan.
Identifiers: Translations, Iron sulfate.

It is well known that copper and its alloys have high natural resistance to corrosion in sea water, since they have tendency to form protective film on their surfaces. In polluted sea water, however, this good behaviour falls down and copper alloys are damaged before long service time. Among many components of polluted sea water, the influences of macro- and micro-organisms on corrosion of copper alloys are discussed with actual examples and experimental results, and some methods of prevention of corrosion are described. (Author)
PB-187 968T HC$3.00 MF$0.65

EMBRITTLEMENT OF VARIOUS STEELS BY ABSORPTION OF HYDROGEN FROM WET HYDROGEN SULFIDE (Versproedung Verschiedener Staehle Durch Wasserstoffaufnahme aus Feuchtem Schwefelwasserstoff),
California Univ., Berkeley. Lawrence Radiation Lab.
Erich E. Hofmann, Erich Martin, and Horst Kuepper. Oct 69, 19p UCRL-Trans-10407
Trans. of Archiv fuer das Eisenhuettenwesen (West Germany) v39 p677-682 1968.

Descriptors: (*Steel, *Hydrogen embrittlement), Hydrogen compounds, Sulfides, Absorption (Physical), Hydrogen, Hardness, Deformation, Grain size, West Germany.
Identifiers: Hydrogen sulfide, Translations.

A study was made of the effect of the chemical composition, initial hardness, cold deformation, grain size, duration of action of the hydrogen sulfide, hydrogen sulfide content in the acting medium and of the conditions of action on the embrittlement of various plain carbon, alloy, and alloy steels. (Author)
PB-188 133T HC$3.00 MF$0.65

11G. Miscellaneous Materials

SOME PROBLEMS OF USING HIGH-TEMPERATURE ORGANIC COOLANTS.
Naval Scientific and Technical Information Centre, London (England).
O. A. Dibrov. May 69, 5p AD-691874, NSTIC-TRANS-2134
Tran- Transl. Into English From Khim. Prom. (Leningrad), V. 25, No. 8, 1968 P 589

Descriptors: *Coolants, *Organic compounds, *Toxicity and safety hazard, Diphenyl compounds, High temperature, Oils, Phenyls.

For abstract, see STAR 07 24.
N69-40610 HC$3.00 MF$0.65

A SYSTEM FOR THE JUDGEMENT OF COMPLIANCE WITH SPECIFICATIONS FOR ROLLED ASPHALT TO B. S. 594,
Road Research Lab., Crowthorne (England).
For primary bibliographic entry see Field 13B.
PB-187 992 HC$3.00 MF$0.65

11H. Oils, Lubricants, and Hydraulic Fluids

DEVELOPMENT OF A LABORATORY TECHNIQUE FOR DEFINING MECHANICAL SHEAR STABILITIES OF MULTI-GRADE ENGINE OILS.
Final rept.,
Army Coating and Chemical Lab Aberdeen Proving Ground Md
Maurice E. LePera, and Jules Pigliacampi. Nov 69, 28p* Rept no. CCL-273

Descriptors: (*Internal combustion engines, Lubricants), (*Lubricants, Physical properties), (*Laboratory equipment, Feasibility studies), Test methods, Test equipment, Lubricant additives, Stability, Degradation, Viscosity, Polymers, Shear stresses, Performance (Engineering).
Identifiers: *Lubricating oils, Dispersers (Agitators), Shear properties, Multigrade lubricating oils, Thickeners (Materials), Automotive engineering, Evaluation.

A program was initiated to define the mechanical shear stability of polymer-thickened lubricating oils in terms of a laboratory bench-scale technique. In subsequent evaluation studies using standard laboratory-type paint blending/mixing devices, a 'kinetic dispersion mill' was found to induce shear degradation of polymer thickeners in multi-grade engine oils. Further refinement of this technique led to the establishing of a satisfactory correlation with single and multicylinder engine tests. (Author)
AD-698 027 HC$3.00 MF$0.65

INVESTIGATION OF THE PROCESS OF DECOMPOSITION OF VARIOUS FRACTIONS OF LIGHT OIL AT HIGH TEMPERATURES,
Foreign Technology Div Wright-Patterson AFB Ohio
D. A. Aliev, and M. M. Ramazanzade. 8 Sep 69, 10p Rept no. FTD-HT-23-426-69
Edited trans. of Azerbaidzhanskoe Neftyanoe Khozyaistvo (USSR) v47 n2 p41-43 1968, by D. Koolbeck.

Descriptors: (*Lubricants, *Pyrolysis), (*Petroleum, Pyrolysis), Degradation, Hydrocarbons, Naphthalenes, Decomposition, USSR.
Identifiers: Translations.

The decomposition of fractions b.190, 210, 230, and 250C, respectively of light oil at high temp. and characteristics of reactions controlled to produce solid aromatic hydrocarbons and especially naphthalene were studied. The gas yield increases slowly with increasing temp. with a simultaneous decrease in the liq. fraction content. Unsaturated hydrocarbons undergo at high temp. condensation, polymerization, alkylation, and separation into coke. The properties of the basic oil change as a result of these reactions. The yield of unsaturated hydrocarbons increases at 750C. The styrene concentration remains stable at these temps., and even increases as a result of breaking up of side chains of benzene homologs. (Author)
AD-698 112 HC$3.00 MF$0.65

THE IMPULSE BREAKDOWN IN INSULATING OIL.
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Maschinenwesen Und Elektrotechnik.
For primary bibliographic entry see Field 9A.
For abstract, see STAR 07 24.
N69-40758 HC$3.00 MF$0.65

RELATIONSHIP BETWEEN THE FORMATION OF FRICTION-REDUCING LAYERS AND THE CHEMICAL CONSTITUTION OF SELECTED ADDITIVES AND ESTER OILS.
Zusammenhaenge Zwischen Der Bildung Abrieebvermindernder Schichten Und Der Chemischen Konstitution Von Ausgewaehlten Additiven Und Esteroelen
Technische Hochschule Munchen (West Germany).
K. A. Davis. 1969, 95p
Lang- in German

Descriptors: *Additives, *Esters, *Friction reduction, *Lubricating oils, Carbonic acid, Chemical properties, Chlorine compounds, Organometallic compounds, Phosphorus compounds, Sulfur compounds.

For abstract, see STAR 07 24.
N69-41039 HC$3.00 MF$0.65

11I. Plastics

AEROSPACE-AFML CONFERENCE ON NDT OF PLASTIC/COMPOSITE STRUCTURES, DAYTON, OHIO, MARCH 18-20, 1969.
Air Force Materials Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 14B.
AD-697 956 HC$3.00 MF$0.65

THERMAL DEGRADATION OF POLYESTERS. PART II. AROMATIC AND SEMIAROMATIC POLYMERS.
Air Force Materials Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 7D.
AD-697 987 HC$3.00 MF$0.65

GLASS FIBER REINFORCED PLASTIC PRESSURELESS TIRE.
Owens-Corning Fiberglas Corp Granville Ohio Technical Center
For primary bibliographic entry see Field 13F.
AD-698 036 HC$3.00 MF$0.65

ESR SPECTRA OF ORIENTED POLYTETRAFLUOROETHYLENE SUBJECTED TO 20-nsec PULSES OF ELECTRONS,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
For primary bibliographic entry see Field 7E.
AD-698 051

EFFECT OF THE METAL SUPPORT ON PHOTOLYSIS OF AN ADDUCT WITH URETHANE AND ISOCYNATE GROUPS,
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 7E.
AD-698 171 HC$3.00 MF$0.65

THE RADIATION CHEMISTRY OF HIGH POLYMERS.
Northwestern Univ., Evanston, Ill. Dept. of Chemistry.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 23 23.
COO-1088-37 HC$3.00 MF$0.65

RADIATION-INDUCED REACTIONS OF SOME FURAN CHEMICALS,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 7C.
For abstract, see NSA 23 23.
ORNL-4373 HC$3.00 MF$0.65

AN INVESTIGATION OF CERTAIN PHYSICAL AND MECHANICAL PROPERTIES OF WOOD-PLASTIC COMBINATIONS,
North Carolina State Univ., Raleigh.
For primary bibliographic entry see Field 11D.
For abstract, see NSA 23 23.
ORO-638 HC$3.00 MF$0.65

EXPERIMENTAL USE OF URETHANE FOAM INSULATION TO CONTROL BRIDGE DECK ICING.
Illinois State Div. of Highways.
For primary bibliographic entry see Field 13M.
PB-188 028 HC$3.00 MF$0.65

EFFECT OF GAMMA RADIATION ON THE DIELECTRIC AND MECHANICAL PROPERTIES OF POLYMETHYL METHACRYLATE AND POLYPROPYLENE (Einfluss von Gamma-Strahlung auf Dielektrische und Mechanische Eigenschaften von Polymethylmethacrylat und Polypropylen),
California Univ., Berkeley. Lawrence Radiation Lab.
H. Sauerbrey, and H. Suhr. Aug 69, 8p
Trans. of Kolloid-Zeitschrift und Zeitschrift fuer Polymere (West Germany) v225 n2 p121-124 Aug 68, by R. Dewar.

Descriptors: (*Plastics, *Radiation chemistry), Dielectric properties, Mechanical properties, Acrylic resins, Gamma rays, West Germany.
Identifiers: *Polypropylene, *Polymethyl methacrylate.

For abstract, see NSA 23 23.
UCRL-Trans-10376 HC$3.00 MF$0.65

11J. Rubbers

RESEARCH STUDY OF NEW CONCEPTS TO PROMOTE THE FAILURE OF POLYMERS BY STRESS CRACKING.
Quarterly progress rept. no. 4, 1 Apr-30 Jun 65,
United States Rubber Co., Wayne, N.J. Research Center.
W. E. Wolstenholme, C. F. Stark, and V. P. Tomaselli. Jul 65, 59p
Contract DA-18-035-AMC-139 (A)
Distribution Limitation now Removed.

Descriptors: (*Elastomers, Failure (Mechanics)), (*Butyl rubber, Failure (Mechanics)), (*Polyethylene plastics, Failure (Mechanics)), Surface tension, Cracks, Organic solvents, Stresses, Test methods, Halogenated hydrocarbons, Nitrobenzenes, Chlorine compounds, Bromine compounds.
Identifiers: *Styrene butadiene resins, Swelling.

The study was to develop a new concept on the failure of polymers by stress cracking. Experiments have shown that failure time of treated samples was not influenced by sample size. Sets of material parameters for untreated and treated samples of SBR tread, butyl tread, and polyethylene have been obtained. Exploratory trials of cracking agents on butyl tread produce a 10 to the 7th power reduction in failure time as was found for SBR tread. Cracking agents effective on tread stocks have little effect on polyethylene. An accelerated test for cracking effectiveness is being developed. Surface properties of polymers appear to have a specific influence in cracking effects. Computation of surface energy of polyethylene by three methods is in fair agreement and has established an important guideline in the mechanism of failure. Calcualtion methods for surface energies of binary mixtures was used to evaluate surface energy at maximum swelling of a vulcanized rubber.
AD-470 650 HC$3.00 MF$0.65

STRESS-STRAIN PROPERTIES OF RUBBER AT PRESSURES ABOVE THE GLASS TRANSITION PRESSURE,
Australian National Univ Canberra Dept of Geophysics and Geochemistry
C. W. Weaver, and M. S. Paterson. 26 Sep 68, 6p
Revision of report 24 Jun 68.
Availability: Pub. in Jnl. of Polymer Science: Part A-2, v7 p587-592 1969. No copies furnished.

Descriptors: (*High-pressure research, Rubber), (*Rubber, Mechanical properties), Synthetic rubber, Transition temperature, Stresses, Strain (Mechanics), Yield point, Modulus of elasticity, Australia.
Identifiers: Glass transition pressure, Vitreous state.

The influence of hydrostatic pressure in raising the glass transition temperature of an amorphous polymer is now well known. In particular, it has been shown that the glass transition temperature in natural rubber is raised to room temperature by a pressure of 5 kbar, and that there is a similar effect in synthetic rubbers. Until recently, there appear to have been no studies of the stress-strain properties of polymer glasses under high confining pressure, especially at temperatures above the zero pressure glass transition temperature. The present measurements on rubber glass at high pressure show that the deformation at high pressure is similar to the cold flow commonly observed in thermoplastics at atmospheric pressure but that the stress levels involved are relatively low when compared to the Young's modulus. (Author)
AD-697 887

SYNTHESIS OF AROMATIC OR ALIPHATIC POLYSULFONE RUBBER.
Technical rept.,
Army Weapons Command Rock Island Ill Science and Technology Lab
L. G. Wiedenmann. Oct 69, 16p* Rept no. TR-70-118

Descriptors: (*Elastomers, Synthesis (Chemistry)), (*Sulfides, Elastomers), (*Vulcanizates, Sulfides), Crosslinking (Chemistry), Vulcanization, Siloxanes, Oxidation, S-heterocyclic compounds, Sulfoxides.
Identifiers: *Polysulfide resins, *Polysulfones, Poly (thio-ethylene), Poly (thio-propylene), Sulfones, Thiiranes, Copolymers, Block copolymers.

Polypropylene sulfide and poly (ethylene sulfide-propylene sulfide), both containing unsaturation, were prepared and cured. The polypropylene sulfide-based vulcanizate, although poorer in original properties, was better in retention of properties after heat aging. Surface oxidized samples of poly (ethylene sulfide-propylene sulfide) showed very low oil and fuel swell but the oxidized material was water soluble. Satisfactory cures were not obtained using the polymers which contained no unsaturation. High polymers could not be obtained with diarylsulfones and blocks of dimethylsiloxanes or fluorocarbons. (Author)
AD-698 020 HC$3.00 MF$0.65

11K. Solvents, Cleaners, and Abrasives

OIL DISPERSING CHEMICALS. A STUDY OF THE COMPOSITION, PROPERTIES AND USE OF CHEMICALS FOR DISPERSING OIL SPILLS.
Federal Water Pollution Control Administration, Edison, N.J. Water Quality Lab.
For primary bibliographic entry see Field 13B.
PB-188 207 HC$3.00 MF$0.65

11L. Wood and Paper Products

AN INVESTIGATION OF CERTAIN PHYSICAL AND MECHANICAL PROPERTIES OF WOOD-PLASTIC COMBINATIONS,
North Carolina State Univ., Raleigh.
For primary bibliographic entry see Field 11D.
For abstract, see NSA 23 23.
ORO-638 HC$3.00 MF$0.65

RIGIDITY OF 48 INCHES BY 40 INCHES DOUGLAS FIR LUMBER AND PLYWOOD PALLETS,
Virginia Polytechnic Inst., Blacksburg.
George Stern. Jul 69, 15p Bull-84
Prepared in cooperation with the Northeastern Forest Experiment Station, Princeton, W. Va. and Better Management Services, Inc., New York, N. Y.

Descriptors: (*Pallets, Structural properties), (*Plywood, Flexural strength), Design, Construction, Specifications, Drop testing, Test methods, Distortion, Tables.
Identifiers: Rigidity, Douglas fir.

The report describes the continuation of the investigation covering the correlation of in-use service test data on pallets with laboratory test data. The pallets of the four designs, subjected to free-fall drop tests, surpassed rigidity criteria based on the arbitrary 5% distortion limit, with the lumber pallets being of medium rigidity and the plywood pallets being extremely rigid. (Author)
PB-188 001 HC$3.00 MF$0.65

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

TOPOLOGICAL PROBLEMS ARISING WHEN SOLVING BOUNDARY VALUE PROBLEMS FOR ELLIPTIC PARTIAL DIFFERENTIAL EQUATIONS BY THE METHOD OF FINITE DIFFERENCES.
Technical rept.,
Wisconsin Univ Madison Dept of Computer Sciences
Colin W. Cryer. Aug 69, 70p Rept no. TR-69
Contract N00014-67-A-0128-0004

Descriptors: (*Programming (Computers), *Partial differential equations), (*Boundary value problems, Topology), (*Numerical analysis, Difference equations), Approximation (Mathematics), Algorithms, Theorems.
Identifiers: *Elliptic differential equations, Finite difference theory.

When the method of finite differences is used to approximately solve a boundary value problem for an elliptic partial differential equation over a two-dimensional domain R, the first step is to choose a set of netpoints, N. Next, a system of algebraic equations connecting the values of the approximate solutions at the netpoints is set up. Finally, the system of algebraic equations is solved. Usually, N is taken to be the set of points belonging to a rectangular grid, together with the points of intersection of gridlines with the boundary of R. When a computer is used, one or more of the following assumptions are often made in order to simplify the programming: (1) All the points of N are gridpoints. (2) The 'interior netpoints' are 'gridconnected'. (3) The number of 'irregular' netpoints is much smaller than the number of 'regular' netpoints. In the present paper these three assumptions are analyzed. (Author)
AD-697 897 HC$3.00 MF$0.65

THE NUMERICAL SOLUTION OF VOLTERRA FUNCTIONAL DIFFERENTIAL EQUATIONS BY EULER'S METHOD.
Technical rept.,
Wisconsin Univ Madison Dept of Computer Sciences
Colin W. Cryer, and Lucio Tavernini. Sep 69, 53p Rept no. TR-71
Contracts DA-31-124-ARO (D)-462, N00014-67-A-0128-0004

Descriptors: (*Cauchy problem, *Numerical analysis), Programming (Computers), Integral equations, Initial value problems, Approximation (Mathematics), Difference equations, Time-lag theory, Theorems.
Identifiers: *Volterra equations, Finite difference theory, Existence theorems, Uniqueness theorems.

Two methods are developed for numerically solving the Cauchy problem for Volterra functional equations; these methods are generalizations of the methods of Euler and Heun for ordinary differential equations. It is proved that these methods converge and a numerical example is given. (Author)
AD-697 898 HC$3.00 MF$0.65

CONVERGENCE OF A DISCRETIZATION FOR CONSTRAINED SPLINE FUNCTION PROBLEMS.
Technical rept.,
Wisconsin Univ Madison Dept of Computer Sciences
James W. Daniel. Oct 69, 32p Rept no. TR-76
Contract N00014-67-A-0128-0004

Descriptors: (*Functions, Approximation (Mathematics)), Functional analysis, Inequalities, Convergence, Theorems.
Identifiers: *Spline functions, Discretization (Mathematics), Sobolev space.

Two discretizations are analyzed for computing general spline functions satisfying discrete and continuous inequality constraints; convergence is proved. (Author)
AD-697 899 HC$3.00 MF$0.65

SOME LABELING THEOREMS FOR PLANAR LINEAR GRAPHS: A CONTRIBUTION TO THE FOUR-COLOR PROBLEM.
Final rept.,
Naval Research Lab Washington D C
Horace M. Trent, B. Lepson, and H. A. Hauptman. 22 Oct 69, 48p* Rept no. NRL-6902

Descriptors: (*Maps, Colors), (*Graphics, Theorems), Polynomials, Spheres.
Identifiers: Graph theory.

According to Courant and Robbins, the four-color problem was probably proposed by Mobius in 1840. It was proposed again by De Morgan in 1850 and by Cayley in 1878. The problem may be stated as follows: Given any linear graph which will map on a plane (or sphere), it is possible to assign one of four colors to each face of the map so that no two faces colored alike have a common edge on their boundaries. In 1879 Kempe published a proof of the conjecture. However, in 1890, Heawood showed that Kempe's proof was defective, by use of a counterexample that disproved one of Kempe's assertions. The portion of this manuscript from Comment 18 through Lemma 24 is designed to take care of the analog to Heawood's counterexample. In the same paper, Heawood showed that five colors were sufficient to color a planar map. The problem has received much attention in the intervening years. Although a number of interesting results have been obtained since 1890, no one has been able to exhibit a planar graph that required more than four colors, nor has anyone been able to prove that four colors were sufficient in all cases. The situation up to now is summed up rather well by Courant and Robbins, 'Despite the efforts of many famous mathematicians, the matter essentially rests with this more modest res t: It has been proved that five colors suffice for al aps and it is conjectured that four will likewis ffice.' This manuscript presents a new approacn to and a partial proof of the conjecture. (Author)
AD-697 922 HC$3.00 MF$0.65

SIMULTANEOUS TESTS FOR EQUALITY OF LATENT ROOTS AGAINST CERTAIN ALTERNATIVES.
Final rept.,
Aerospace Research Labs Wright-Patterson AFB Ohio
P. R. Krishnaiah, and V. B. Waiker. Jul 69, 35p Rept no. ARL-69-0119
Errata sheet inserted.

Descriptors: (*Matrix algebra, Multivariate analysis), Distribution theory, Transformations (Mathematics), Test methods.
Identifiers: Wishart matrices, MANOVA matrices, Covariance matrices, Canonical correlation matrices, Statistical inference, Covariance, Eigenvalues.

The authors proposed procedures for testing for equality of latent roots of matrices against some restricted alternatives when the latent roots of the associated random matrices have certain distributions. The random matrices considered are (i) Wishart matrix (ii) (S sub 1) (S sub 2) superscript (-1) (iii) matrix connected with MANOVA and (iv) matrix associated with canonical correlations; here S sub 1 and S sub 2 are independently distributed central Wishart matrices. (Author)
AD-697 996 HC$3.00 MF$0.65

ANALOG COMPUTER STABILIZATION INVESTIGATION OF LAGRANGIAN EQUATIONS.
Technical rept. Mar 68-Sep 69,
Army Weapons Command Rock Island Ill Science and Technology Lab
Paul Cacari. Oct 69, 55p Rept no. TR-70-108

Descriptors: (*Howitzers, Recoil mechanisms), (*Recoil mechanisms, Equations of motion), Differential equations, Mathematical models, Matrix algebra, Numerical analysis, Analog computers, Simulation, Stability.
Identifiers: *Lagrange equations of motion, Four degrees of freedom, Degrees of freedom, Computerized simulation.

The use of Lagrange's method for development of a mathematical model to define the energy distribution of a system yields in normal coordinates a set of differential equations wherein the highest order term of every variable appears in every equation. In an attempt to simulate such a system on an analog computer, algebraic loops with gains= or> may be required, but cause instability in the equipment. This report concerns an investigation of possible methods of either eliminating the offending algebraic loops or minimizing their gain. Specifically, the Lagrangian method, which defines the soft-recoil system for a 155mm Howitzer, is examined only to stabilize the equations rather than to perform a parametric variation study. (Author)
AD-698 021 HC$3.00 MF$0.65

NORMS OF THE SUCCESSIVE OVERRELAXATION METHOD AND RELATED METHODS.
Interim technical rept. no. 23,
Texas Univ Austin Computation Center
David M. Young, and David R. Kincaid. Sep 69, 103p Rept no. TNN-94 AROD-3772:52-M
Grants DA-ARO (D)-31-124-G1050, DA-ARO (D)-31-124-G721
Sponsored in part by Grants NSF-GP-8442, NSF-GP-5253.

Descriptors: (*Matrix algebra, Programming (Computers)), (*Iterative methods, Convergence), Boundary value problems, Difference equations, Theorems.
Identifiers: Successive overrelaxation method, Gauss-Seidel method, Dirichlet problem.

Norms of several iterative methods for solving the linear system Au= b are developed. These methods include the successive overrelaxation method, the cyclic Chebyshev semi-iterative method, and other related methods. Theoretical and numerical comparisons are given for the iterative methods and norms considered. The results indicate that by using a different norm than was previously considered, the successive overrelaxation method compares more favorably with the cyclic Chebyshev semi-iterative and with the other iterative methods considered. (Author)
AD-698 040 HC$3.00 MF$0.65

DIFFERENTIAL DYNAMIC PROGRAMMING METHOD FOR BANG-BANG CONTROLS PROBLEMS: ALGORITHMS AND ERROR ANALYSIS.
Interim technical rept.,
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
D. H. Jacobson. 1969, 23p Rept no. TR-598
Contract N00014-67-A-0298-0006, Grant NGR-22-007-068
Availability: Pub. in Various Jnls.

Descriptors: (*Control systems, Nonlinear systems), (*Dynamic programming, Algorithms), Optimization, Adaptive control systems, Automation, Theses.
Identifiers: Differential dynamic programming, Control theory, Bang bang control.

Differential dynamic programming is a technique, based on dynamic programming rather than the calculus of variations, for determining the optimal control function of a nonlinear system. A class of nonlinear control problems, linear in the control variables, is studied using differential dynamic programming. It is shown that for the free-end-point problem, the first partial derivatives of the optimal cost function are continuous throughout the state space, and the second partial derivatives experience jumps at switch points of the control function. A control problem that has an analytic solution is used to illustrate these points. (Author)
AD-698 086

NUMERICALLY STABLE EXPLICIT INTEGRATION TECHNIQUES USING A LINEARIZED RUNGE KUTTA EXTENSION,
Boeing Scientific Research Labs Seattle Wash Information Sciences Lab
R. H. Allen. Oct 69, 39p* Rept nos. Information Sciences-39, D1-82-0929

Descriptors: (*Nonlinear differential equations, Programming (Computers)), (*Integration, Numerical methods and procedures), Iterative methods, Difference equations, Complex variables, Integral transforms, Stability.
Identifiers: *Runge-Kutta method, Truncation errors, Laplace transformation, Computer aided design.

Computer aided design requires repeated evaluation of the performance of a system model during development of the model and during parameter optimization. The analysis of a differential system model thus requires an efficient solution of a set of nonlinear ordinary differential equations, x dot= f (x,t), that model the system. Accurate system models contain short and long term effects; therefore such models have wide ranges of time constants (eigenvalues). Most numerical integration rules, including the Runge Kutta rules, require for numerical stability of the calculated response that the integration time step be limited by the smallest and possibly most uninteresting time constant. Some implicit integration rules, which require iteration, have no numerical instabilities regardless of the time step size. Presented in this paper is an investigation of a class of explicit integration rules, requiring no iteration, that possess numerical stability for any integration time step. Integration rules do not require limitation of the integration time step to provide numerical stability can reduce the number of integration steps significantly and thus greatly decrease the computer execution time necessary to calculate the response. (Author)
AD-698 139 HC$3.00 MF$0.65

ON A PERTURBATION THEORY USING LIE TRANSFORMS,
Boeing Scientific Research Labs Seattle Wash Mathematics Research Lab
Jacques Henrard. Nov 69, 25p Rept nos. Mathematical Note-630, D1-82-0931

Descriptors: (*Perturbation theory, Transformations (Mathematics)), Celestial mechanics, Partial differential equations, Recursive functions, Identities, Series, Algorithms, Theorems.
Identifiers: Lie transformation, Lie series.

Kamel has recently extended to non-Hamiltonian equations a perturbation theory using Lie transforms. It is shown in this report extension can be approached from an intrinsic viewpoint, which reformulation leads to a simpler algorithm. Kamel's contribution is then completed by establishing rules for inverting the transformation generated by the perturbation theory, and for composing two such transformations. (Author)
AD-698 140 HC$3.00 MF$0.65

A DISASTER USING APPROXIMATIONS,
Rand Corp Santa Monica Calif
Joel Spencer. Nov 69, 6p Rept no. P-4249

Descriptors: (*Transcendental functions, *Approximation (Mathematics)), Special functions (Mathematical), Taylor's series, Accuracy.
Identifiers: *Logarithm functions.

The author gives an example of the error resulting from truncating a series too soon.
AD-698 183 HC$3.00 MF$0.65

FISHER EXACT PROBABILITY TEST,
Center for Naval Analysis, Arlington, Va. Operations Evaluation Group.
V. G. Stotland. Jan 69, 20p OEG-Research Contrib-108
Contract N00014-68-A-0091
Distribution Limitation now Removed.

Descriptors: (*Statistical tests, Computer programs), Probability, Sampling.
Identifiers: *Fisher exact probability test.

The paper defines the 'fisher exact probability test,' shows in what cases its use is indicated, and explains the use of a fortran program which calculates the required values. (Author)
AD-849 853 HC$3.00 MF$0.65

SOME SIMPLE PROOFS IN SEMI-MARKOFF PROCESSES.
Center for Naval Analysis, Arlington, Va. Operations Evaluation Group.
For primary bibliographic entry see Field 15A.
AD-849 854 HC$3.00 MF$0.65

PROGRESS REPORT NO. 42 ON COMPUTING AND APPLIED MATHEMATICS FOR THE HALF YEAR JANUARY 1-JUNE 30, 1969. TECHNICAL SUMMARY FOR TASK I AND V ALSO ADMINISTRATIVE AND FINANCIAL SUMMARY FOR ENTIRE CONTRACT.
New York Univ., N.Y. AEC Computing and Applied Mathematics Center.

8 Sep 69, 18p
Contract AT (30-1)-1480

Descriptors: (*Hydrodynamics, Shock waves), (*Boundary value problems, Numerical analysis), Air mass analysis, Programming (Computers), N-body problem, Partial differential equations, Nonlinear differential equations.

For abstract, see NSA 23 23.
NYO-1480-122 HC$3.00 MF$0.65

ON THE STABILITY OF NONLINEAR OPERATOR DIFFERENTIAL EQUATIONS, AND APPLICATIONS.
Pittsburgh Univ., Pa. Dept. of Electrical Engineering.
C. V. Pao, and W. G. Vogt. 27 Apr 69, 28p NASA-CR-106300
Contract NGR-39-011-039

Descriptors: *Differential equations, *Hilbert space, *Nonlinearity, Equilibrium equations, Group theory, Operators (mathematics).

For abstract, see STAR 07 24.
N69-40241 HC$3.00 MF$0.65

AN EXTENSIVE ENGLISH LANGUAGE BIBLIOGRAPHY ON GRAPH THEORY AND ITS APPLICATIONS.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
N. Deo. 15 Oct 69, 86p NASA-CR-106288, JPL-TR-32-1413
Contract NAS7-100

Descriptors: *Bibliographies, *Graphs (charts), *Topology, Linearity, Network synthesis, Switching theory.

For abstract, see STAR 07 24.
N69-40245 HC$3.00 MF$0.65

PROBABILITY LIMIT THEOREMS AND THE CONVERGENCE OF FINITE DIFFERENCE APPROXIMATIONS OF PARTIAL DIFFERENTIAL EQUATIONS.
Brown Univ., Providence, R. I. Center for Dynamical Systems.
H. J. Kushner. 1968, 45p NASA-CR-106403
Contracts NGL-40-002-015, AF-AFOSR-67-0693-A

Descriptors: *Convergence, *Finite difference theory, *Partial differential equations, *Probability theory, Continuity (mathematics), Functions (mathematics), Limits (mathematics), Riemann manifold.

For abstract, see STAR 07 24.
N69-40944 HC$3.00 MF$0.65

STUDIES IN SYSTEM SIMULATION.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
R. Saeks. 27 Aug 69, 43p NASA-TM-X-53868

Descriptors: *Computerized simulation, *Digital systems, *Topology, Approximation, Computer storage devices, Discrete functions, Matrices (mathematics), Taylor series.

For abstract, see STAR 07 24.
N69-41152 HC$3.00 MF$0.65

ACTIVE FUNCTION SYNTHESIS UTILIZING MODELING AND SCALING PROCEDURES FINAL TECHNICAL REPORT, 1 OCT. 1968 - 30 SEP. 1969.
Ohio Univ., Athens. Dept. of Electrical Engineering.
W.-K. Chen. 30 Sep 69, 8p NASA-CR-106453, EER-10-25
Contract NGR-36-009-012

Descriptors: *Algorithms, *Dimensional analysis, *Models, *Optimization, *Scaling laws, Aerospace engineering, Bibliographies, Dimensionless numbers, Matrices (mathematics), Methodology, Research and development.

For abstract, see STAR 07 24.
N69-41209 HC$3.00 MF$0.65

ON APPROXIMATION OF FUNCTIONS, TOPOLOGICAL MAPPINGS AND NONLINEAR FEEDBACK CONTROL SYSTEMS.
Massachusetts Inst. of Tech., Cambridge. Electronic Systems Lab.
M. Athans, A. S. Debs, and K. M. Joseph. Jun 69, 92p NASA-CR-106398, ESL-R-389
Contracts NGL-22-009-124, NSF GK-2645

Descriptors: *Feedback control, *Mapping, *Nonlinear systems, *Topology, Algorithms, Hilbert transformation, Lorentz transformations, Optimal control.

For abstract, see STAR 07 24.
N69-41248 HC$3.00 MF$0.65

A THEORY OF THEORIES.
Stanford Univ., Calif. Inst. for Plasma Research.
P. A. Sturrock. Jul 69, 36p NASA-CR-106482, SU-IPR-324
Contracts NGR-05-020-272, F44620-69-C-0008

Descriptors: *Data reduction, *Hypotheses, *Observation, *Theories, Analysis (mathematics), Formulas, Mathematical models, Probability theory.

For abstract, see STAR 07 24.
N69-41321 HC$3.00 MF$0.65

STATISTICAL PARAMETRIC AND NON-PARAMETRIC METHODS TO DETERMINE THE DISTRIBUTION OF MECHANICAL COMPONENTS.
Metodi Statistici Parametrici E Non Parametrici Per La Stima Dell'affidamento Di Componenti Meccanici
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
D. Basile, and G. Voltra. Jul 69, 64p EUR-4282-I Lang- in Italian, English Summary

Descriptors: *Failure analysis, *Performance prediction, *Performance tests, *Statistical analysis, Component reliability, Data reduction, Probability distribution functions.

For abstract, see STAR 07 24.
N69-41389 HC$3.00 MF$0.65

AN ISOPERIMETRIC INEQUALITY IN THE THEORY OF SELF-CONTAINED NUMERICAL INTEGRATION FORMULAS.
Preliminary Report.,

California Univ., Livermore. Lawrence Radiation Lab.
F. N. Fritsch. Sep 69, 22p HCRL-72066

Descriptors: (*Integration, Numerical analysis), (*Numerical analysis, Inequalities), Programming (Computers), Topology.
Identifiers: Numerical integration, Isoperimetric inequalities.

A closed region R that satisfies the conditions the integral over R of ((x sub i) (x sub j)dx)∓ delta sub ij 1 sub zero, where delta sub ij is the Kronecker delta, is said to be Stroud normal. The C-radius rho (R) is the radius of the largest sphere centered at the centroid of R that is contained in R. Conjecture 1: Among all convex Stroud normal subsets of E superscript n7 rho assumes its minimum on the n-simplex and its maximum on the closed ball. It is shown how this conjecture arose in the theory of self-contained numerecal integration formulas. In the case n= 2 the conjecture is proved for regular polygons and is shown to be equivalent to Conjecture 2: Among all convex Stroud normal m-gons, p-rho assumes its minimum on the triangle and its maximum on the regular m-gon. The latter conjecture is proved for m= 4 and numerical evidence is presented in support of the conjecture for 5= or< m= or< 12. (Author)
PB-188 143 HC$3.00 MF$0.65

AN EXTENSION OF THE MOMENT METHOD IN STATISTICAL ESTIMATION,
State Univ. of New York, Buffalo. Div. of Interdisciplinary Studies and Research.
T. T. Soong. May 68, 16p Rept. no. 40
Grant NSF-GK-1834X

Descriptors: (*Statistical analysis, *Decision theory), Programming (Computers), Statistical distributions, Analysis of variance, Probability density functions, Sampling.
Identifiers: Statistical decision theory, Parameter estimation, Moments method (Statistics), Maximum likelihood estimation, Asymptotic efficiency.

In parameter estimation problems, a distinct advantage associated with the method of moments over the maximum likelihood method is its practical expediency. That the method has enjoyed little popularity stems mainly from the fact that it generally leads to inferior estimates in terms of low asymptotic efficiency. In this paper an optimal scheme of combining a set of moment estimators is considered. It is shown that the scheme leads to an estimator offering computational simplicity as well as increase in efficiency under general conditions. (Author)
PB-188 161 HC$3.00 MF$0.65

12B. Operations Research

MEDIAN TWO-PERSON GAME THEORY FOR MEDIAN COMPETITIVE GAMES.
Technical rept.,
Southern Methodist Univ Dallas Tex Dept of Statistics
John E. Walsh. 25 Sep 69, 16p Rept no. THEMIS-SMU-TR-45
Contract N00014-68-A-0515
Report on Themis Signal Analysis Statistics Research Program.

Descriptors: (*Game theory, Decision making), Optimization, Probability, Set theory, Identification, Theorems.
Identifiers: Themis project, Strategy.

A form of discrete two-person game theory based on median considerations is discussed as having very strong application advantages over expected value game theory. The class of median competitive games, where both players can be simultaneously protective and vindictive, is huge compared to the corresponding class for expected value game theory, and the median approach is usable for games where the numbers in one or both payoff matrices do not satisfy the arithmetical operations. A subclass of the median competitive games is identified. The complete class is specified in this paper and a method is given for determining median optimum strategies. The evaluation methods given are oriented toward minimum application effort.
AD-697 935 HC$3.00 MF$0.65

ADVANCED MATERIEL SYSTEMS PLANNING.
Technical memo.,
Case Inst of Tech Cleveland Ohio Operations Research Group
Burton V. Dean, and Lawrence E. Hauser. 15 Sep 66, 85p Rept no. TM-65
Contract Nonr-1141 (19)
See also AD-663 970.
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Management engineering, Mathematical models), (*Decision theory, Systems engineering), Dynamic programming, Cost effectiveness, Computer programs, Data processing systems, Optimization, Budgets, Probability, Problem solving, Army operations.
Identifiers: Research and development, Materiel systems, Alternatives.

The report is concerned with the development of mathematical models, computer programs, and data requirements to conduct development systems planning in large R and D organizations. (Author)
AD-697 971 HC$3.00 MF$0.65

AN ALGORITHM FOR SEPARABLE NONCONVEX PROGRAMMING PROBLEMS: NONLINEAR CONSTRAINTS.
Technical paper,
Research Analysis Corp Mclean Va
Richard M. Soland. Nov 69, 32p Rept no. RAC-TP-380
Contract DAHC19-69-C-0017

Descriptors: (*Nonlinear programming, Algorithms), Convex sets, Sequences, Convergence, Theorems.
Identifiers: *Nonconvex programming, Convex functions, Branch and bound method.

The paper extends the algorithm described in a previous report to problems in which the objective function and the constraint functions are the sums of functions of the various decision variables. The important feature of the algorithm is that the global solution to a problem will be found even if the objective function is not convex and the feasible region is not a convex set. (Author)
AD-698 018 HC$3.00 MF$0.65

DIFFERENTIAL DYNAMIC PROGRAMMING METHOD FOR BANG-BANG CONTROLS PROBLEMS: ALGORITHMS AND ERROR ANALYSIS.
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
For primary bibliographic entry see Field 12A.
AD-698 086

ESTIMATION OF THE FLOW IN TREE GRAPHS,
Research Inst of National Defence Stockholm (Sweden)
Ove Frank. 24 Sep 68, 13p Rept no. FOA-P-B8009-11

Descriptors: (*Graphics, Flow charting), Analysis of variance, Decision theory, Algorithms, Theorems, Sweden.
Identifiers: *Network flows, Trees (Mathematics).

Observations of the flow through the arcs in a tree graph are available, and it is required to combine these to provide estimators of the arc flows. An algorithm for estimating the root flow is presented. The algorithm gives linear, unbiased estimators. If the arc-flow observations are uncorrelated, the algorithm gives the linear, unbiased, minimum-variance estimators. The algorithm is shown to be applicable to estimate the flow through an arbitrary arc of the tree. In conclusion, various fields of application of the estimation problems are indicated. (Author)
AD-698 130 HC$3.00 MF$0.65

MEASURE THEORETIC STRUCTURES FOR SEQUENTIAL DECISION MODELS,
Rand Corp Santa Monica Calif
Ralph E. Strauch. Dec 69, 20p Rept no. P-4259

Descriptors: (*Decision theory, Sequential analysis), (*Measure theory, Probability), Dynamic programming, Game theory, Topology.
Identifiers: Probability measures, Metric spaces, Gambling.

An expository paper is presented, concerning the elements which must be represented in probabilistic models of general state space sequential decision problems. These elements are described, and the ways they are represented in two such models, a dynamic programming model due to Blackwell and a gambling model due to Dubins and Savage, are examined. If the set of possible positions in which the decisionmaker might find himself is uncountable, then a measure theoretic structure connecting the basic elements of the problem is required in order to ensure adequate definitions of the overall dynamics of the problem and the value to the decisionmaker of his overall behavior. The dynamic programming model uses a countably additive measure structure based on metric considerations, while the gambling model uses finitely additive measures defined on all subsets of the basic space. (Author)
AD-698 145 HC$3.00 MF$0.65

PARAMETRIC DECOMPOSITION PROGRAMMING.
Technical rept.,
Massachusetts Inst of Tech Cambridge Operations Research Center
Kanianthra Mani Chandy. Oct 69, 130p Rept no. TR-45
Contracts Nonr-3963 (06), DA-31-124-ARO (D)-209

Descriptors: (*Linear programming, Algorithms), (*Quadratic programming, Algorithms), Optimization, Theorems, Theses.
Identifiers: Integer programming, Knapsack problem.

The report is concerned with the decomposition of block-diagonal linear and quadratic programming. We are primarily concerned with obtaining solutions as the right-hand side constraint vector and/or objective function is varied. A 'projection' technique similar to Rosen's is used. The decomposition of integer programming problems is also considered. (Author)
AD-698 155 HC$3.00 MF$0.65

MULTIPLE CHANNEL QUEUES IN HEAVY TRAFFIC. IV. LAW OF THE ITERATED LOGARITHM.
Technical rept.,
Stanford Univ Calif Dept of Operations Research
Donald L. Iglehart. Nov 69, 29p Rept no. TR-8
Contract N00014-67-A-0112-0031, Grant NSF-GP-8790
See also AD-691 271.

Descriptors: (*Queueing theory, Stochastic processes), Measure theory, Topology, Sequences, Theorems.
Identifiers: Functional law of the iterated logarithm, Law of the iterated logarithm, Multiple channel queues.

The queueing system considered consist of r. independent arrival channels and s independent service

channels. These systems are assumed to be in heavy traffic, that is, the traffic intensity is greater than or equal to 1. Functional laws of the iterated logarithm are obtained for the queue length, departure, load, and waiting time processes. As immediate corollaries, the ordinary laws of the iterated logarithm are obtained for these processes. Finally, as an application of the functional law of the iterated logarithm, a limit theorem is obtained for the fraction of time the queue length process is above a given function. (Author)
AD-698 180 HC$3.00 MF$0.65

UHELP USERS MANUAL,
Houston Univ Tex Cullen Coll of Engineering
For primary bibliographic entry see Field 9B.
AD-698 189 HC$3.00 MF$0.65

AN APPROACH FOR MODELING THE US TRANSPORTATION SYSTEM FOR ANALYSIS OF EMERGENCY CAPABILITY,
Research Analysis Corp Mclean Va
For primary bibliographic entry see Field 15E.
AD-698 202 HC$3.00 MF$0.65

A GAME THEORY ANALYSIS OF PROPOSED STRATEGIES OF AN AERIAL SEARCH FOR A MOBILE SURFACE TARGET.
Naval Postgraduate School, Monterey, Calif.
For primary bibliographic entry see Field 15G.
AD-807 385 HC$3.00 MF$0.65

SENSITIVITY METHODS IN THE DESIGN OF ADAPTIVE CONTROL SYSTEMS.
Saskatchewan Univ., Saskatoon. Div. of Control Engineering.
P. N. Nikiforuk, and S. G. Rao. 1968, 11p

Descriptors: *Adaptive control, *Numerical analysis, *Sensitivity, *Systems engineering, Differential equations, Independent variables, Liapunov functions, Linear systems, Mathematical models.

For abstract, see STAR 07 24.
N69-41154 HC$3.00 MF$0.65

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

MINIATURE CRYOGENIC REFRIGERATORS.
Technical rept.,
Stevens Inst of Tech Hoboken N J Cryogenics Center
John G. Daunt, and William S. Goree. Aug 69, 48p* Rept no. TR-1 (ONR)
Contract Nonr-263 (70)
Prepared in cooperation with Stanford Research Inst., Menlo Park, Calif. Low Temperature Physics Program, Contract N00014-67-C-0393.

Descriptors: (*Refrigeration systems, State-of-the-art reviews), (*Cryogenics, Refrigeration systems), Cryogenics, Portable, Performance (Engineering), Efficiency, Tables, Graphics, Spacecraft components, Design.
Identifiers: *Cryogenic refrigerators, Production models, Prototypes.

The report gives data in tabular and graphical form on miniature cryogenic refrigerators available commercially in the USA and Europe. It also gives data on prototype miniature refrigerators under development in commercial laboratories. A graphical comparison is given of the refrigerators listed by presenting efficiencies, weight/refrigeration ratios and volume/refrigeration ratios. Brief discussions are given also of passive cooling techniques and of possible developments envisioned for the future. (Author)
AD-697 972 HC$3.00 MF$0.65

ULTRASONIC EVALUATION OF TUBE WASTAGE IN MARINE BOILERS,
Defence Research Establishment Pacific Victoria (British Columbia)
B. F. Peters, J. A. O'Malia, and B. W. Greenwood. 1969, 9p Rept no. Reprint-69-3
Availability: Pub. in Transactions of the Joint Conference on Industrial Ultrasonics, Institution of Electronic and Radio Engineers, London, p177-184 1969. No copies furnished.

Descriptors: (*Boiler tubes, Nondestructive testing), (*Non-destructive testing, *Ultrasonic radiation), Thickness, Probes, Canada.

An ultrasonic probe was developed to gauge the thicknesses of partially wasted superheater tubes in a Y100 Babcock and Wilcox boiler. The contact probe is inserted into the 1 inch inside diameter tubes from the header. The probe is easy to use and shows promise of being an exceedingly useful NDT tool in marine boilers. (Author)
AD-698 012

OPTICAL PUMPS FOR LASERS. PHASE II.
Westinghouse Research Labs., Pittsburgh, Pa.
For primary bibliographic entry see Field 20E.
AD-801 249 HC$3.00 MF$0.65

OPTICAL PUMPS FOR LASERS - PHASE II.
Westinghouse Research Labs., Pittsburgh, Pa.
For primary bibliographic entry see Field 20E.
AD-811 564 HC$3.00 MF$0.65

OPTICAL PUMPS FOR LASERS - PHASE II.
Westinghouse Research Labs., Pittsburgh, Pa.
For primary bibliographic entry see Field 20E.
AD-812 044 HC$3.00 MF$0.65

OPTICAL PUMPS FOR LASERS - PHASE II.
Westinghouse Research Labs., Pittsburgh, Pa.
For primary bibliographic entry see Field 20E.
AD-817 202 HC$3.00 MF$0.65

IMPROVING THE PERFORMANCE OF ELECTROLUMINESCENT LAMPS AT ELEVATED TEMPERATURES.
Final rept. 1 May 66-Nov 67,
Lear Siegler, Inc., Grand Rapids, Mich. Instrument Div.
Darrel T. Thompson, Sidney V. Petertyl, and Chester A. Wysocki. Jul 68, 147p GRR-019-0168
AFFDL-TR-68-103
Contract AF 33 (615)-3872
Distribution Limitation now Removed.

Descriptors: (*Lighting equipment, Thermal stability), (*Display systems, Electroluminescence), Phosphorescent materials, Zinc sulfides, Refractory coatings, Fluidized bed processes, Aluminum compounds, Oxides, Beryllium oxides, Silicon dioxide, Tin compounds, Titanium compounds, Zinc compounds, Zirconium oxides, Vapor plating, Brightness, Power.
Identifiers: *Electroluminescent lamps.

The report provides a performance characterization of electroluminescent lamps with regard to temperature. Performance of typical state-of-the-art constructions are compared to special el lamps using experimentally modified phosphors developed through this program. A method for encapsulation of individual phosphor particles by coating their surfaces with refractory oxide materials in a fluidized bed reactor is described. The effect of operation at various temperatures--from-50C to+100C--on brightness, current, power, and spectral emission is described for el lamps using coated and uncoated zinc sulphide and zinc sulphoselenide phosphors. Improvement in operating life is reported for titanium dioxide coated zinc sulphoselenide EL phosphor. (Author)
AD-840 747 HC$3.00 MF$0.65

HIGH HEAT FLUX HEATER DEVELOPMENT. STATUS REPORT II,
Atomics International, Canoga Park, Calif.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 23 23.
AI-AEC-12813 HC$3.00 MF$0.65

HYPERBOLOIDS OF REVOLUTION SUPPORTED ON COLUMNS. (1) COLUMN-SUPPORTED HYPERBOLOIDS UNDER GRAVITY LOADING. (2) COLUMN-SUPPORTED HYPERBOLOIDS UNDER WIND LOADING.
Washington Univ., St. Louis, Mo. Dept. of Civil and Enviromental Engineering.
For primary bibliographic entry see Field 13M.
PB-188 160 HC$3.00 MF$0.65

REFRIGERATION TECHNIQUES,
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
T. R. Strobridge. 1968, 18p R-540 BM-IC-8417
Pub. in Proceedings of the Helium Applications Symposium, Washington, D.C., 23-24 Oct 68 and the Helium Centennial Symposium, Atlantic City, N.J., 11 Sep 68.

Descriptors: (*Refrigerants, *Helium), (*Refrigeration systems, State-of-the-art reviews), (*Cryogenics, Refrigeration systems), Liquefied gases, Cryogenics, Condensers (Liquefiers), Refrigerant condensers, Heat exchangers, Joule-Thomson effect, Thermodynamics, Brayton cycle, Thermodynamic cycles, Evaporators.
Identifiers: *Absorption refrigeration, Refrigerators, Gas expanders, Claude cycle.

Contents: Introduction-Helium as a refrigerant; The relationship of refrigerators and liquefiers; Counterflow heat exchangers; The Joule-Thomson process; The Brayton and Claude cycles; Expanders; The Gifford-McMahon cycle; Modern refrigerators and liquefiers.
PB-188 214 HC$3.00 MF$0.65

13B. Civil Engineering

FACTS ON RADIATION AND FALLOUT. AN APPENDIX TO THE PROTOTYPE MANUAL ON CIVIL DEFENSE ASPECTS OF WATER-WORKS OPERATION.
Engineering-Science, Inc., Arcadia, Calif.
For primary bibliographic entry see Field 15C.
AD-445 514 HC$3.00

CHEMICAL CONCENTRATIONS OF POLLUTANT LEAD AEROSOLS, TERRESTRIAL DUSTS, AND SEA SALTS IN GREENLAND AND ANTARCTIC snow strata,
Scripps Institution of Oceanography La Jolla Calif
For primary bibliographic entry see Field 8L.
AD-697 964 HC$3.00 MF$0.65

DETERMINATION OF TRACE QUANTITIES OF HALOGENATED HYDROCARBONS IN GAS SAMPLES,
Naval Research Lab Washington D C
For primary bibliographic entry see Field 7D.
AD-698 120 HC$3.00 MF$0.65

AN EXPERIMENTAL EVALUATION OF A NEW APPROACH TO CONCRETE OVERLAY.
Naval Civil Engineering Lab., Port Hueneme, Calif.
For primary bibliographic entry see Field 1E.
AD-856 136 HC$3.00 MF$0.65

PUBLIC IMPROVEMENTS AND CAPITAL BUDGET: SURGOINSVILLE, TENNESSEE.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.

Jul 69, 60p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Urban planning, *Tennessee), Budgets, Statistical data, Costs, Advanced planning, Statistical data, Approximation (Mathematics).
Identifiers: *Surgoinsville (Tennessee), Public improvements, Capital budgets.

The study covers a public improvements program and a capital budget for the city of Surgoinsville, Tennessee. Recommended public improvements are scheduled over the 20-year period 1969-1989. The capital budget study presents various means to finance the public improvements program as well as a list of federal aid programs. (Author)
PB-187 970 HC$3.00 MF$0.65

CAPITAL IMPROVEMENTS PROGRAM AND BUDGET, MILLEN, GEORGIA.
Georgia State Planning Bureau, Atlanta.

Nov 69, 19p

Descriptors: (*Urban planning, *Georgia), Budgets, Management planning, Scheduling, Classification, Statistical data, Predictions.
Identifiers: Capital improvements, Area planning and developments, *Millen (Georgia).

The report represents an initial effort toward adoption of an official capital improvements program and budget for the development of an orderly and workable program to meet the facility and service needs of the city of Millen. (Author)
PB-187 977 HC$3.00 MF$0.65

INITIAL HOUSING ELEMENT, BRUNSWICK COUNTY, NORTH CAROLINA.
North Carolina Dept. of Local Affairs, Salisbury. Div. of Community Planning.

Sep 69, 25p

Descriptors: (*Management planning, *North Carolina), (*Housing, Abundance), Inventory, Housing projects, Money, Population, Wages, Costs, Economics, Problem solving, Urban planning, Rural areas, Beaches.
Identifiers: *Brunswick County (North Carolina), Financing.

The Brunswick County Initial Housing Element is a brief examination of the existing housing inventory within the county. Major problems have been analyzed as well as the obstacles to overcoming the problems. Proposed objectives to upgrade the housing inventory are listed. A statement of existing and proposed planning activities for the county are contained within the report and have been coordinated with the objectives for upgrading the housing inventory. (Author)
PB-187 979 HC$3.00 MF$0.65

LAND DEVELOPMENT PLAN FOR PAMLICO COUNTY, NORTH CAROLINA.
North Carolina Dept. of Local Affairs, Salisbury. Div. of Community Planning.

Aug 69, 22p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Management planning, *North Carolina), Industries, Housing, Commerce, Recreation, Roads, Site selection, Transportation, Water supplies, Soils, Agriculture, Forestry, Rivers, Rural areas.
Identifiers: *Pamlico County (North Carolina), Land development, Regional planning and development, Objectives, Land use.

Pamlico County's land development goals and objectives are set forth. The residential, commercial, industrial, recreation and thoroughfare elements are discussed. The reasons for the selection of the different areas are given. Limiting factors given in previous studies such as lack of transportation, lack of water and sewer facilities and wet soils are utilized. The overall plan points to continuation of the county in agriculture and forestry with development of recreation potential. The county's main asset is its waterways which can be utilized for boating, swimming and fishing. (Author)
PB-187 980 HC$3.00 MF$0.65

NENANA-COMPREHENSIVE PLANNING STUDIES.
Alaska State Housing Authority, Anchorage.

31 Dec 68, 136p
Prepared in cooperation with Lutes and Amundson Community Planners, Springfield, Oreg.

Descriptors: (*Urban planning, *Alaska), Economics, Floods, Decision making, Budgets, Problem solving, Natural resources, Climatology, Sociometrics, Predictions.
Identifiers: *Nenana (Alaska).

Future and continued growth of Nenana is uncertain, due to recurring flooding, the disastrous flood of 1967, and inpending decisions that may re-structure the community's economic base. The report analyzes proposals for flood protection, physical and financial resources of the community and decisions which will affect the community's economy, and future growth based on alternative courses of action related to economic expectations. (Author)
PB-187 989 HC$3.00 MF$0.65

LAND DEVELOPMENT PLAN, NASH COUNTY, NORTH CAROLINA.
North Carolina Dept. of Local Affairs, Salisbury. Div. of Community Planning.

Sep 69, 51p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Management planning, *North Carolina), Housing, Commerce, Industries, Housing projects, Site selection, Law, Roads, Transportation, Recreation, Construction, Standards, Water supplies, Agriculture, Trailers, Education, Urban planning, Rural areas.
Identifiers: *Nash County (North Carolina), *Land development, *Regional planning and development, Land use zoning, Building codes, Public facilities, Public works, Industrial parks, Objectives, Conservation.

The Land Development Plan for Nash County is a combination of desirable physical development goals and methods of implementation to achieve these goals. Specific areas for the future development of residential, commercial, industrial, public and semi-public land use is shown on the Land Development Plan. Development criteria is listed for the purpose of sound future development by means of accepted planning principles. Implementation tools are at work in Nash County in the form of zoning and subdivision regulations. Zoning is enacted in several areas of the county but is not county-wide. Subdivision regulations cover the entire county. (Author)
PB-187 990 HC$3.00 MF$0.65

A SYSTEM FOR THE JUDGEMENT OF COMPLIANCE WITH SPECIFICATIONS FOR ROLLED ASPHALT TO B. S. 594.
Road Research Lab., Crowthorne (England).
R. Hardman. 1969, 52p RRL-LR276

Descriptors: (*Pavements, Asphalt), (*Asphalt, Acceptability), Specifications, Standards, Statistical analysis, Quality control, Commerce, Roads, Great Britain.

The report describes a system for the judgement of compliance with specifications for rolled asphalt based on the comparison of a given job with a 'Standard Job'. Individual sample analyses are classified as acceptable or defective according to certain limits of composition. These limits are chosen to exclude 10 per cent of sample results from the 'Standard Job', which represents a limiting level of acceptable quality in statistical terms. The actual rate of occurrence of defective results is then compared with the rate expected from the 'Standard Job', in terms of the permissible number of defectives for a given number of sample analyses. The system guarantees that, in the long run, work of the same quality as the 'Standard Job' will be accepted at least 95 per cent of the time. The effect of applying this system is discussed in the context of the distribution of quality of rolled-asphalt manufacture achieved in the U.K. over the past few years and it is suggested that an economic limitation of the consumer's risk will be obtained if the acceptance decision is based on a running sequence of 20 sample analyses. (Author)
PB-187 992 HC$3.00 MF$0.65

RHODE ISLAND TRANSIT PLAN: FUTURE MASS TRANSIT SERVICES AND FACILITIES FOR THE STATE OF RHODE ISLAND.
Rhode Island Statewide Comprehensive Transportation and Land Use Planning Program, Providence.
For primary bibliographic entry see Field 13F.
PB-187 993 HC$3.00 MF$0.65

TRANSPORTATION PLAN: SURGOINSVILLE, TENNESSEE.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.
Jul 69, 33p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. See also PB-187 996.

Descriptors: (*Urban planning, *Tennessee), (*Transportation, Urban planning), Transportation, Management planning, Roads, Passenger vehicles, Cargo vehicles, Classification, Control systems, Construction, Predictions.
Identifiers: *Surgoinsville (Tennessee), Streets.

The Surgoinsville transportation plan analyses present conditions in the city and planning region. This includes all existing transportation facilities such as passenger services, the freight service as well as the existing street pattern. Streets are classified as either arterial, collector, connector or minor. A program to better the community street system is presented. (Author)
PB-187 995 HC$3.00 MF$0.65

SURGOINSVILLE TRANSPORTATION PLAN: SUMMARY.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.

Jul 69, 10p
See also PB-187 995.

Descriptors: (*Urban planning, *Tennessee), (*Transportation, Urban planning), Reviews, Predictions, Traffic, Roads, Inequalities, Management planning.
Identifiers: *Surgoinsville (Tennessee), Streets.

Traffic volumes on the streets and roads of Surgoinsville and its planning region have increased with the widespread use of the automobile. It is the

purpose of the study to evaluate the efficiency of existing transportation facilities, determine current transportation deficiencies and probable future needs, make recommendations to improve deficiencies, and present the governmental body and the public with a report on needs. (Author)
PB-187 996 HC$3.00 MF$0.65

ST. LOUIS METROPOLITAN AREA RAPID TRANSIT FEASIBILITY STUDY. PHASE II REPORT: ALTERNATIVE TRANSIT SYSTEMS.
East-West Gateway Coordinating Council, East St. Louis, Ill.
For primary bibliographic entry see Field 13F.
PB-187 997 HC$3.00 MF$0.65

A COMPREHENSIVE MASTER PLAN, TOWN AND VILLAGE OF CASTILE, WYOMING COUNTY, NEW YORK. VOLUME I. BASIC STUDIES.
New York State Office of Planning Coordination, Buffalo.

Oct 69, 133p
Prepared in cooperation with Smith (Herbert H.), Rochester, N. Y. See also Volume 2, PB-187 999.

Descriptors: (*Urban planning, *New York), Terrain, Sanitary engineering, Civil engineering, Wastes (Sanitary engineering), Education, Housing, Transportation, Population, Economics, Commerce, Budgets, Recreation.
Identifiers: *Castile (New York).

Contained in this report are all of the individual basic planning studies for the Town and Village of Castile's Comprehensive Master Plan. The specific areas covered are: regional evaluation, existing land use, physical features, housing conditions, circulation and transportation, municipal facilities, population, economic base analysis, municipal finance, and a central business district study. For each of the aforementioned study areas, a survey was made for existing conditions and/or facilities; where applicable, projections for the future were made, and their implications for planning are noted. These basic studies indicate that Castile is in a line of expansion of both the Rochester and Buffalo metropolitan areas, and that its central location, along with relatively low land costs and adequate transportation facilities may make it attractive for residences, businesses, and manufacturing. In addition, its location with respect to these metropolitan areas makes it ideal for second and seasonal home location. Also, development pressures are expected to be felt in agricultural areas; since agriculture will continue to play a dominant role in the economy of the area, local zoning should be geared toward preserving prime agricultural land. (Author)
PB-187 998 HC$3.00 MF$0.65

A COMPREHENSIVE MASTER PLAN, TOWN OF CASTILE, WYOMING COUNTY, NEW YORK: VOLUME II. MASTER PLAN AND IMPLEMENTATION.
New York State Office of Planning Coordination, Buffalo.

Oct 69, 162p
See also Volume 1, PB-187 998. Prepared in cooperation with Smith (Herbert H.), Associates, Rochester, N.Y.

Descriptors: (*Urban planning, *New York), (*Law, Urban planning), Economics, Budgets, Commerce, Population, Recreation, Education, Civil engineering, Transportation.
Identifiers: *Castile (New York), Land use zoning ordinances.

The report contains the second and third phases of the Comprehensive Plan for the Town of Castile: the Master Plan and recommended measures for implementation. The Master Plan section assimilates the data from Volume I: Basic Studies, and makes a series of recommendations in the form of four specific plans: The Land Use Plan; The Circulation Plan; The Community Facilities Plan; The Financial Plan. The final portion of the Comprehensive Plan is the Implementation section, which proposes Land Subdivision Regulations and a Zoning Ordinance; these two measures are designed to insure a high quality of development in Castile and are suggested as two of the most effective instruments in carrying out the recommendations of the Master Plan. In addition, this volume contains a special report addressing itself to the problems of the Silver Lake resort area in the Towns of Castile and Perry, and suggesting improvements and redevelopment measures to achieve a high quality of development in this area. (Author)
PB-187 999 HC$3.00 MF$0.65

CHURCH HILL, TENNESSEE, ANNUAL REPORT.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.

Jul 69, 15p

Descriptors: (*Urban planning, *Tennessee), Management planning, Population, Growth, Law, Roads, Housing, Sanitary engineering, Budgets, Reports.
Identifiers: *Church Hill (Tennessee), Land use zoning, Public works, Public utilities.

The Church Hill Regional Planning Commission reports on work concerned with various parts of the comprehensive planning program involving implementation of plan elements, population growth, improvement of community facilities, and administration of subdivision regulations. (Author)
PB-188 003 HC$3.00 MF$0.65

TRANSPORTATION PLAN, LENOIR CITY - LOUDON - LOUDON COUNTY, TENNESSEE.
Tennessee State Planning Commission, Knoxville. East Tennessee Office.

May 69, 97p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Transportation, *Tennessee), (*Urban planning, Transportation), Roads, Traffic, Standards, Design.
Identifiers: Lenoir City (Tennessee), Loudon (Tennessee), Loudon County (Tennessee).

The report is part of a series designed to provide a comprehensive plan to guide the growth and development of the Lenoir City - Loudon - Loudon County planning regions. The transportation plan outlines the existing transportation systems and sets forth applicable standards which should be used in evaluating new transportation systems. The existing systems are then analyzed in terms of these standards, to determine deficiencies and inadequacies upon which recommendations for future improvements are based. (Author)
PB-188 004 HC$3.00 MF$0.65

ILLIOPOLIS, ILLINOIS, COMPREHENSIVE PLAN.
Sangamon County Regional Planning Commission, Springfield, Ill.

Jan 69, 96p

Descriptors: (*Urban planning, *Illinois), Population, Economics, Analysis, Terrain, Transportation, Rural areas, Budgets, Predictions.
Identifiers: Capital improvements, *Illiopolis (Illinois), Central city, Economic analysis, Land use.

The report is a comprehensive plan for a village of 1000. It consists of a brief population and economic analysis, a compilation of existing land use, an analysis of the transportation needs of the community, and ends with a comprehensive land use and thoroughfare plan as well as notes on implementation including capital improvements programming. The report stresses the differentiating characteristics of this small town and examines its functions against a background of rural midwest values. (Author)
PB-188 005 HC$3.00 MF$0.65

ROADSIDE VEGETATION AND EROSION CONTROL. PART A: AGRONOMY. PART B: HORTICULTURE.
Final rept. 1 Apr 66-31 Mar 69,
Alabama State Highway Dept., Montgomery.
Ray Dickens, and H. D. Orr. Mar 69, 241p HPR-44
Prepared in cooperation with Auburn Univ., Ala. and Bureau of Public Roads, Washington, D.C.

Descriptors: (*Roads, Alabama), (*Plants (Botany), Erosion), Control, Grasses, Seeds, Fertilizers, Herbicides, Management planning, Acclimatization, Nitrogen compounds, Potassium compounds, Phosphorus compounds, Effectiveness, Survival, Trees, Classification, Growth substances, Germination.
Identifiers: Leguminous plants, Perennials.

The final report of this three-year study includes some of the results of agronomic and horticultural research conducted during a period of study which started in 1963. In Part A, Agronomy, twenty-two different experiments concerning legume establishment, grass (including bamboo) species, seedbed preparation, fertilization needs, herbicides and related areas are described. The Part B, Horticulture, phase of the report covers several studies to determine the adaptability and survival of various woody species along roadsides; to collect, characterize, propogate and establish native species; and to evaluate the feasibility of using herbicides in established plantings. (BPR Abstract)
PB-188 008 HC$3.00 MF$0.65

HOMER COMPREHENSIVE DEVELOPMENT PLAN.
Alaska State Housing Authority, Anchorage.

1969, 124P
Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only. PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Urban planning, *Alaska), Economics, Natural resources, Population, Soil mechanics, Terrain, Transportation, Budgets.
Identifiers: *Homer (Alaska), Land use, Community facilities.

The plan analyzes the city's economic potential including the impact of resource development in the southwest Kenai Peninsula and projects economic change and future population. The influences of soils and topography, existing land uses, transportation, community facilities and governmental powers and finances are described as they affect the city's future. (Author)
PB-188 009 HC$3.00 MF$0.65

A COMPREHENSIVE MASTER PLAN, TOWN OF MARION, WAYNE COUNTY, NEW YORK. VOLUME I: BASIC STUDIES.
New York State Office of Planning Coordination, Buffalo.

Aug 69, 132p
See also Volume 2, PB-188 019. Prepared in cooperation with Herbert H. Smith Associates, Rochester, N.Y.

Descriptors: (*Urban planning, *New York), Housing, Transportation, Roads, Education, Population, Growth, Economics, Commerce, Sociology, Industries, Money, Advanced planning, Agriculture, Rural areas, Sanitary engineering, Police, Fire safety.

Identifiers: *Marion (New York), Land use, Public utilities, Land use zoning, Public facilities.

Contained in this report are all of the individual basic planning studies for the Town of Marion's Comprehensive Master Plan. The specific areas covered are: regional evaluation, existing land use, physical features, housing conditions, circulation and transportation, municipal facilities and services, educational facilities, population, economic base analysis, municipal finance, and a central business area. For each of the specific study areas, the existing conditions or facilities are surveyed and their respective implications for planning are noted. Where applicable, projections for the future are made. (Author)
PB-188 015 HC$3.00 MF$0.65

CONCENTRATION OF EFFLUENTS IN A PLUME AS PREDICTED BY A MODEL AND OBSERVED IN FIELD,
Massachusetts Inst. of Tech., Cambridge. Fluid Mechanics Lab.
Gee Tsang. Aug 69, 17p* Pub-69-7
Grant PHS-AP-00678-01

Descriptors: (*Air pollution, *Atmospheric motion), (*Waste gases, Concentration (Chemistry)), Theory, Mathematical analysis, Sulfur compounds, Dioxides.
Identifiers: *Sulfur dioxide, Sulfur hexafluoride, *Flue gases.

Field-measured data of sulfur dioxide, SO2, and sulfur hexafluoride, SF6, concentrations in a plume are compared with theoretical predictions based on a plume rise model. The comparison shows that the theoretical model does correctly predict the concentration of pollutants in a plume. The comparison of the concentrations of SO2 and SF6, which was an inert gas released to the stacks as a tracer, shows that in the experimental range of 20 miles, the depletion of SO2 is not an important factor in estimating the rate of dilution. (Author)
PB-188 017 HC$3.00 MF$0.65

ANALYSIS AND MODELING OF RELATIONSHIPS BETWEEN ACCIDENTS AND THE GEOMETRIC AND TRAFFIC CHARACTERISTICS OF THE INTERSTATE SYSTEM,
Westat Research, Inc., Bethesda, Md.
For primary bibliographic entry see Field 13L.
PB-188 021 MF$0.65

STATE PLAN OF PUBLIC INVESTMENT FOR THE SOUTH CAROLINA COASTAL PLAINS AREA: FISCAL YEAR 1968-1969.
South Carolina State Planning and Grants Div., Columbia.

1969, 84P
Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Urban planning, *South Carolina), Natural resources, Population, Transportation, Economics, Geography, Housing, Labor, Recreation, Urban areas, Agriculture.

An abbreviated description is given of: (1) the Coastal Plains Regional Commission and its objectives, philosophy and financial assistance programs; and (2) the role and function of the State Plan for Public Investment in the regional development program. A considerable amount of facts are summarized about the Area's history, geography, resources, population, economy and other relevant information. This serves as supporting information for recommendations contained in other sections of the Investment Plan. The section on Developmental Philosophy and Concepts is divided into five parts: PART A describes in general terms the State's goals and objectives for improvement of the Area's present situation; PART B identifies the Area's potentials and problems and recommends developmental and remedial programs; PART C delineates geographic points in the Area which have significant potential for future growth; PART D determines program priorities and specifies how investments will be scheduled; PART E describes a continuing process for improving the State's Coastal Plains regional development program. Specific projects designed to stimulate the Area's development are described. Estimated costs and recommended locations are also presented. (Author)
PB-188 022 HC$3.00 MF$0.65

PUBLIC IMPROVEMENTS AND CAPITAL BUDGET: CHURCH HILL, TENNESSEE.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.
Jul 69, 76p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Urban planning, *Tennessee), Budgets, Costs, Classification, Advanced planning, Statistical data, Approximation (Mathematics).
Identifiers: *Church Hill (Tennessee), Public improvements, Capital budgets.

The study consists of a public improvements program and a capital budget for the city of Church Hill, Tennessee. The recommended public improvements are scheduled over the 20-year period 1969-89. The capital budget study presents various means to finance the public improvements program as well as a list of federal aid programs. (Author)
PB-188 024 HC$3.00 MF$0.65

INITIAL RECONNAISSANCE SURVEY, DARLINGTON COUNTY, SOUTH CAROLINA.
South Carolina State Development Board. Div. of Community Planning.

1969, 43P
Prepared in cooperation with Darlington County Planning Board, S.C.

Descriptors: (*Urban planning, *South Carolina), Population, Rural areas, Sex, Aging (Physiology), Transportation, Industries, Natural resources, Soils, Economics, Agriculture, Labor.
Identifiers: Darlington County (South Carolina).

A standard Reconnaissance Survey conducted in accordance with HUD 701 requirements and designed to identify the problems and needs of the locality that can be beneficially affected by planning and to devise a comprehensive planning program tailored to the locality's problems and needs. (Author)
PB-188 025 HC$3.00 MF$0.65

INITIAL RECONNAISSANCE SURVEY, CLINTON, SOUTH CAROLINA.
South Carolina State Planning and Grants Div., Columbia.

1969, 30P

Descriptors: (*Urban planning, *South Carolina), Population, Housing, Transportation, Recreation, Education, Economics, Urban areas.
Identifiers: *Clinton (South Carolina).

A standard Reconnaissance Survey conducted in accordance with HUD 701 requirements and designed to identify the problems and needs of the locality that can be beneficially affected by planning and to devise a comprehensive program tailored to the locality's and needs. (Author)
PB-188 027 HC$3.00 MF$0.65

EXPERIMENTAL USE OF URETHANE FOAM INSULATION TO CONTROL BRIDGE DECK ICING.
Illinois State Div. of Highways.
For primary bibliographic entry see Field 13M.
PB-188 028 HC$3.00 MF$0.65

IMPROVEMENTS AND INNOVATIONS IN URBAN BUS SYSTEMS.
Organization for Economic Co-Operation and Development, Paris (France). Directorate for Scientific Affairs.

Oct 69, 227p*

Descriptors: (*Transportation, *Urban planning), (*Passenger vehicles, Efficiency), Velocity, Scheduling, Design, Control systems, Reliability, Air pollution, France.
Identifiers: *Bus lines, Buses (Vehicles), Electric buses.

Contents: The urban bus--an overview; Bus priority schemes--increasing the speed of bus travel; The dual mode bus--increasing the flexibility of bus transportation; Bus vehicle design; Real time bus control--improving the reliability of bus transportation; Bus scheduling and dispatching--improving the efficiency of bus operation; Demand responsive bus systems--adapting the bus to changing urban conditions.
PB-188 030 HC$3.00 MF$0.65

A GENERALIZED LAND USE PLAN, THE GREATER CLEMSON AREA, SOUTH CAROLINA.
Pickens County Planning and Development Commission, Easley, S.C.

15 Jul 69, 106p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Urban planning, *South Carolina), Economics, Sociology, Predictions, Advanced planning, Growth, Population, Wages, Universities, Recreation, Education, Political science, Culture, Religion, Statistical data, Money.
Identifiers: *Clemson (South Carolina), *Land use, *Regional planning and development, Public utilities.

The report consists of an analysis of significant economic, sociological, and physical forces in the Greater Clemson area and the development of a generalized land use plan for this area. Using data generated by other studies of the area, projections of land use were planned to accommodate the growth of the area and at the same time to minimize undesirable features of such growth. Guide lines are therefore established for future translation of the generalized land use plan into specific objectives by the appropriate local, state, and federal authorities. (Author)
PB-188 032 HC$3.00 MF$0.65

EARLY TRAFFICKING OF THIN CONCRETE PATCHES,
Road Research Lab., Crowthorne (England).
I. E. Lancaster. 1969, 18p RRL-LR267

Descriptors: (*Roads, Pavements), (*Pavements, Maintenance), (*Cements, Trafficability), Time, Concrete, Mixtures, Great Britain.
Identifiers: *High early strength cements, Mortars (Material), Portland cements, Aluminate cements, Laying, Setting time, Evaluation.

The most economical way of repairing superficial defects in concrete roads is to patch with fresh cement mortar but this currently involves closing the area of the highway concerned for at least four days to allow the new mortar to harden sufficiently to

carry traffic. The report describes the laying and early performance of various cement-mortar patches used to repair concrete roads, carriageway of the A.59 Trunk Road at Longton, Lancashire. The patches were opened to heavy traffic of about 18,000 vehicles per day from four to thirty-six hours after laying. Ordinary Portland, rapid-hardening, and high-alumina cements were used to produce the mortars. All the patches laid were in good condition after twelve months' trafficking. (Author)
PB-188 033 HC$3.00 MF$0.65

HOUSING-DENVER SMSA: INVENTORY, PROJECTIONS, PROBLEMS AND ISSUES.
Summary rept.
Denver Regional Council of Governments, Colo.

Nov 69, 47p

Descriptors: (*Urban planning, *Colorado), (*Housing, Urban planning), Inventory, Predictions, Commerce, Economics, Abundance, Population, Demolition, Construction, Maintenance, Management planning, Costs, Employment, Wages, Political science.
Identifiers: *Denver (Colorado), *Regional planning and development, Ethnic groups.

The report presents data reflecting the housing inventory in the Denver SMSA as of January 1, 1969, and projections of housing requirements to 1975. Salient housing market problems are highlighted and recommendations made regarding them. (Author)
PB-188 044 HC$3.00 MF$0.65

MINICAR TRANSIT SYSTEM. FEASIBILITY STUDY. BOOK 2.
Pennsylvania Univ., Philadelphia.
For primary bibliographic entry see Field 13F.
PB-188 046 HC$3.00 MF$0.65

THE HYDRAULIC EFFICIENCY AND SPACING OF B.S. ROAD GULLEYS,
Road Research Lab., Crowthorne (England).
K. Russam. 1969, 40p RRL-LR277

Descriptors: (*Roads, *Drainage), Rainfall, Fluid flow, Efficiency, Design, Hydraulic systems, Great Britain.

The specification for British Standard gulley gratings, B.S.497, was revised in 1967. Measurements of the hydraulic efficiency of these gratings were made on a tilting platform which simulated a curbed road surface and which permitted the flow of water to the gulley to be varied by changes in the width of flow, the crossfall, and the longitudinal gradient. These efficiencies are given in the report. Consideration is also given to rainfall intensities and durations in the United Kingdom and a method for the design of spacing of gulleys is suggested based on the hydraulic efficiency of the gulleys and on tolerable widths of flow of water at the edge of the road. (Author)
PB-188 047 HC$3.00 MF$0.65

APPLICATION REVIEW PROCEDURES.
Planning Guide no. 4.
Metropolitan Planning Commission-Kansas City Region, Mo.
Sep 69, 37p
Sponsored by Dept. of Housing and Urban Development, Washington, D.C.

Descriptors: (*Urban planning, Handbooks), (*Federal budgets, Urban areas), (*Missouri, Urban planning), Reviews, Standards, Classification, Organizations, Money, Personnel, Sequences, Kansas.
Identifiers: Capital improvements, *Kansas City (Missouri), Application reviews, Counties.

The document is a planning guide which outlines the Metroplan Commission's responsibilities and procedures for reviewing capital improvements projects and applications for Federal grants and loans. Procedures have been established to aid each governmental unit in the region in expediting the application. (Author)
PB-188 056 HC$3.00 MF$0.65

FEDERAL PUBLIC LAND LAWS AND POLICIES RELATING TO INTENSIVE AGRICULTURE. VOLUME I. LEGAL STUDY.
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 2B.
PB-188 061 HC$3.00 MF$0.65

FEDERAL PUBLIC LAND LAWS AND POLICIES RELATING TO INTENSIVE AGRICULTURE. VOLUME II.
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 2B.
PB-188 062 HC$3.00 MF$0.65

FEDERAL PUBLIC LAND LAWS AND POLICIES RELATING TO INTENSIVE AGRICULTURE. VOLUME III. WORKING PAPERS: FEDERAL PUBLIC LANDS: THEIR DISPOSAL AND PERMITTED USE, 1934-67,
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 2B.
PB-188 063 HC$3.00 MF$0.65

FEDERAL PUBLIC LAND LAWS AND POLICIES RELATING TO INTENSIVE AGRICULTURE. VOLUME IV: WORKING PAPERS: FEDERAL PUBLIC LANDS: ECONOMICS OF FARM SIZE IN WESTERN UNITED STATES.
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 2B.
PB-188 064 HC$3.00 MF$0.65

STUDY OF THE DEVELOPMENT, MANAGEMENT, AND USE OF WATER RESOURCES ON THE PUBLIC LANDS. VOLUME I. SUMMARY AND LEGAL STUDY,
Public Land Law Review Commission, Washington, D.C.
Charles F. Wheatley, Jr., Charles E. Corker, Thomas M. Stetson, and Daniel J. Reed. Oct 69, 462p*
See also Volume 2, PB-188 066. Revision of report dated Mar 69.

Descriptors: (*Water supplies, Management planning), Law, Commerce, Storage, Quality control, Research program administration, Forestry, Reclamation, Floods, Soils, Recreation, Economics, Sedimentation, Reviews.
Identifiers: Ground water, Water resources, *Public land law, Water conservation.

The study was designed to provide the public land law review commission with a review, description, and analysis of the laws, policies, practices, and agency programs related to the development, use, and management of water originating on or flowing across public lands for both Federal and non-Federal uses on the public lands; a collection and analysis of data relating to water yields on the public lands and the present and future use of such water for Federal and non-Federal purposes; and the collection and analysis of data concerning the relationship of major watershed protection and management programs on the public lands to water yields and water quality. (Author)
PB-188 065 HC$3.00 MF$0.65

STUDY OF THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES ON THE PUBLIC LANDS. VOLUME II. RESOURCES, ECONOMICS, AND TECHNOLOGY,
Public Land Law Review Commission, Washington, D.C.
Charles F. Wheatley, Jr., Charles E. Corker, Thomas M. Stetson, and Daniel J. Reed. Oct 69, 424p*
See also Volume 1, PB-188 065. Revision of report dated Mar 69.

Descriptors: (*Water supplies, Management planning), Reviews, Law, Research program administration, United States Government, Forestry, Recreation, Fishes, Department of Defense, Sedimentation, Irrigation systems, Agriculture, Electric power production.
Identifiers: Water resources, Water reclamation, Water conservation, Watersheds, Water rights, *Public land law, Public land, Ground water, Water consumption, Water storage.

Contents: Description and water yield characteristic of the eleven western states; Conservation needs of the public land watershed; Sediment source and sediment production; Water uses, use patterns and users (Irrigated lands and agricultural investment, Hydroelectric power; Consumptive use of water on public lands); Watershed management program in the eleven western states.
PB-188 066 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF HYDROCHLORIC ACID.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Quade R. Stahl. Sep 69, 82p*
Contract PH-22-68-25

Descriptors: (*Hydrochloric acid, *Air pollution), (*Industrial medicine, Hydrochloric acid), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Corrosion, Chlorine compounds, Halocarbon plastics.
Identifiers: *Hydrogen chloride, Phytotoxicity.

Contents: Effects on humans (Toxicity, Sensory thresholds, Synergistic effects); Effects on animals, Effects on plants (Phytotoxicity, Incidents of plant damage), Effects on materials; Environmental air standards; Natural occurrence; Production sources (By-product process, Salt-acid process, Chlorine-hydrogen synthesis); Product sources; Other sources (Coal, Fuel oil, Automobile exhaust, Burning of chloride-containing plastics; Burning of paper products; DDT production; Lemon pulp extraction); Environmental air concentrations.
PB-188 067 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF HYDROGEN SULFIDE.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Sydney Miner. Sep 69, 107p*
Contract PH-22-68-025

Descriptors: (*Sulfides, *Air pollution), (*Industrial medicine, Sulfides), Hydrogen compounds, Reviews, Toxicity, Odors, Humans, Animals, Plants (Botany), Paints, Metals, Corrosion, Petroleum industry, Chemical industry, Mining engineering, Iron industry, Incinerators, Tanning, Water pollution, Sewage, Chemical analysis, Volumetric analysis, Methylene blue.
Identifiers: *Hydrogen sulfide, Coke, Kraft paper, Paper industry, Scrubbers.

Contents: Hydrogen sulfide's effects on humans: (Odor threshold, Pollution occurrences); Effects on animals; Effects on plants; Effects on materials: (Effects on paint, Effects on metals); Environmental air standards; Natural occurrence; Production sources (Petroleum industry, Petrochemical plant complexes, Kraft mills, Coke ovens, Mining, Iron-steel industry and foundries, Chemical industry,

Animal processing plants and tanneries); Product sources; Other sources (Combustion processes, Polluted water, Well water, Sewage plants and sewers); Environmental air concentration; Abatement (Kraft paper mills, Petroleum industry and petrochemical plants, Coke-oven plants and chemical plants, Coal piles, Tanneries, Sewers and sewage plants), Economics, Methods of analysis.
PB-188 068 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ETHYLENE.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Quade R. Stahl. Sep 69, 65p*
Contract PH-22-68-25

Descriptors: (*Ethylenes, *Air pollution), (*Plants (Botany), Ethylenes), Reviews, Toxicity, Humans, Animals, Photochemistry, Metabolism, Combustion products, Exhaust gases, Incinerators, Economics, Chemical analysis, Gas chromatography.
Identifiers: *Plant growth, Agricultural wastes, Automobile exhaust, Spectroscopic analysis.

Contents: Ethylene's effects on humans; Effects on animals; Effects on plants (Phytotoxicity, Sensitivity of plants, Incidents of plant damage); Effects on materials; Environmental air standards; Natural occurrence; Production sources (Pyrolytic processes); Product sources; Other sources (Automobile and diesel emissions, Incinerator effluents, Burning of agricultural wastes); Environmental air concentrations; Abatement; Economics; Methods of analysis.
PB-188 069 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF NICKEL AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Ralph J. Sullivan. Sep 69, 76p*
Contract PH-22-68-25

Descriptors: (*Nickel, *Air pollution), (*Nickel compounds, Air pollution), (*Industrial medicine, Nickel), Reviews, Toxicity, Humans, Animals, Plants (Botany), Respiratory diseases, Cancer, Mining engineering, Refining (Metallurgy), Asbestos, Coal, Fuel oil, Incinerators, Economics, Metal carbonyls, Chemical analysis.
Identifiers: *Dermatitis, *Nickel carbonyls, Spectrochemical analysis, Spectroscopic analysis.

Contents: Nickel's and nickel compound's effects on humans (Dermatitis, Respiratory disorders, Cancer of the respiratory tract); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Mines, Metallurgical industry); Product sources; Other sources (Asbestos, Coal, Fuel oil, Incineration); Environmental air concentration; Abatement; Economics; Methods of analysis (Sampling methods, Quantitative methods (Nickel particulates, Nickel carbonyl)).
PB-188 070 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ARSENIC AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Ralph J. Sullivan. Sep 69, 72p*
Contract PH-22-68-25

Descriptors: (*Arsenic, *Air pollution), (*Arsenic compounds, Air pollution), (*Arsines, Air pollution), (*Industrial medicine, Arsenic), Reviews, Toxicity, Humans, Animals, Plants (Botany), Pesticides, Manufacturing methods, Cotton, Chemical analysis, Economics, Coal, Chemical analysis.
Identifiers: Arsenic oxides, Arsenic organic compounds, Cotton gins, Smelting.

Contents: Arsenic's and arsenic compounds' effect on humans (Carcinogenesis, Community episodes); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources (Pesticides, Cotton gins); Environmental air concentrations; Abatement; Economics; Methods of analysis.
PB-188 071 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ZINC AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Yanis C. Athanassiadis. Sep 69, 90p*
Contract PH-22-68-25

Descriptors: (*Zinc, *Air pollution), (*Zinc compounds, Air pollution), (*Industrial medicine, Zinc), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Zinc coatings, Refining (Metallurgy), Bronze, Brass, Furnaces, Incinerators, Chemical analysis.
Identifiers: Zinc oxides.

Contents: Zinc's and zinc compounds' effects on humans (Inhalation, Ingestion, Skin contact); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Mining, Smelting and refining); Product sources (Zinc galvanizing, Brass production, Incineration); Environmental air concentrations; Abatement (Zinc smelting operations, Galvanizing operations, Zinc-alloy sweating operations, Secondary brass melting operations, Open-hearth and electric-arc furnaces, Steel operations); Economics; Methods of analysis.
PB-188 072 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF PHOSPHORUS AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Yanis C. Athanassiadis. Sep 69, 86p*
Contract PH-22-68-25

Descriptors: (*Phosphorus, *Air pollution), (*Phosphorus compounds, Air pollution), (*Organic phosphorus compounds, Air pollution), (*Fertilizers, Air pollution), (*Industrial medicine, Phosphorus), Reviews, Toxicity, Humans, Animals, Plants (Botany), Phosphoric acids, Phosphonic acids, Phosphates, Fuel additives, Gasoline, Fluorides, Manufacturing methods, Chemical analysis, Phosphines.
Identifiers: Spectroscopic analysis.

Contents: Phosphorus' and phosphorus compounds' effects on humans; Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources (Phosphoric acids, Phosphate fertilizers, Phosphine); Other sources (Oil-fired boilers, Iron and steel industry, Transportation sources); Environmental air concentrations; Abatement; Economics; Methods of analysis; Sampling methods (Free phosphorus in air, Phosphoric acid (Plants, stack gasses), Phosphine); Quantitative methods (Phosphorus and phosphoric acid, Phosphine, Organophosphorus pesticides).
PB-188 073 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF MERCURY AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Quade R. Stahl. Sep 69, 108p*
Contract PH-22-68-25

Descriptors: (*Mercury, *Air pollution), (*Mercury compounds, Air pollution), (*Industrial medicine, Mercury), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Chemical analysis, Economics, Metalorganic compounds, Monitors.
Identifiers: *Mercury organic compounds, Spectrochemical analysis.

Contents: Mercury's and mercury compounds' effects on humans (Absorption, Distribution, Excretion, Inhibition of enzymes, Toxicity); Effects on animals; Effects on plants; Effects on materials; Environmental air standards (Mercury and its inorganic compounds, Mercury organic compounds); Natural occurrence; Production sources; Product sources; Environmental air concentrations; Abatement; Methods of analysis.
PB-188 074 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF CHROMIUM AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Ralph J. Sullivan. Sep 69, 86p*
Contract PH-22-68-25

Descriptors: (*Chromium, *Air pollution), (*Chromium compounds, Air pollution), (*Industrial medicine, Chromium), (*Chromates, Air pollution), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Refractory materials, Chemical industry, Iron industry, Chromizing, Asbestos, Coal, Cements, Welding rods, Chemical analysis.
Identifiers: Spectrochemical analysis.

Contents: Chromium's and chromium compounds' effects on humans (Chromium metal, Trivalent chromium, Chromates, Carcinogenesis, Nutrition); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Metallurgical industry, Refractory materials); Product sources (Chemical industry, Chrome plating); Other sources (Asbestos, Coal, Cement, Welding rods); Environmental air concentrations; Abatement; Economics; Methods of analysis.
PB-188 075 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF AEROALLERGENS (POLLENS).
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Harold Finkelstein. Sep 69, 118p*
Contract PH-22-68-25

Descriptors: (*Pollen, *Air pollution), Effectiveness, Humans, Allergy, Plants (Botany), Materials, Sources, Economics, Control, Analysis.

Aeroallergens (pollens) are airborne materials which elicit a hypersensitivity response in susceptible individuals. The two major responses exhibited are allergic rhinitis and bronchial asthma. The pollens of wind-pollinated plants are the most important of the aeroallergens, and ragweed pollen is commonly found in this group. Ragweed pollen is the cause of more than 90 percent of pollinosis in this country. Other aeroallergens include molds, house dust, danders, and a miscellaneous group of insecticides, cosmetics, paints, and vegetable fibers. Most of the aeroallergen investigations have been concerned with ragweed. Pollen counts are taken daily in many local areas throughout the country. These counts are used as guidelines for anticipating and understanding the incidence of pollinosis in a given area rather than as standards. Local programs of ragweed eradication generally have met with little success in controlling pollen concentrations. The pollen can be windborne for many miles, and therefore pollen entering a city from the outside usually is sufficient to cause pollinosis in the susceptible population. The gravity slide method has been accepted as the standard procedure for pollen sampling by the Pollen Survey Committee of the American Academy of Allergy. (Author)
PB-188 076 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF SELENIUM AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Quade R. Stahl. Sep 69, 88p*
Contract PH-22-68-25

Descriptors: (*Selenium, *Air pollution), (*Selenium compounds, Air pollution), (*Industrial medicine, Selenium), Reviews, Toxicity, Humans, Animals, Plants (Botany), Selenides, Nutrition, Grasses, Cereals, Cancer, Manufacturing methods, Monitors, Chemical analysis.
Identifiers: Selenium oxides, Senenates, Hydrogen selenide, Selenium organic compounds.

Contents: Selenium's and selenium compounds' effects on humans (Chronic effects, Acute poisoning, Retention and elimination, Detoxification, Selenium in nut rition, Elemental selenium, Selenium dioxide, Selenites, Selenates, Hydrogen selenide, Selenium oxychloride, Organoselenium compounds); Effects on animals; Effects on plants (Selenium indicator plants, Secondary selenium absorbers, Grains, Vegetables, Grasses, Other vegetation); Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources; Environmental air concentrations; Abatement; Economics; Methods of analysis.
PB-188 077 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF BERYLLIUM AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Norman L. Durocher. Sep 69, 92p*
Contract PH-22-68-25

Descriptors: (*Beryllium, *Air pollution), (*Beryllium compounds, Air pollution), (*Industrial medicine, Beryllium), Reviews, Toxicity, Humans, Animals, Plants (Botany), Mining engineering, Refining (Metallurgy), Beryllium oxides, Beryllium alloys, Solid rocket propellants, Coal, Economics, Chemical analysis, Quantitative analysis, Respiratory diseases, Cancer.
Identifiers: *Berylliosis, Fluorescent lamps, Spectroscopic analysis.

Contents: Beryllium's and beryllium compounds' effects on humans (Acute beryllium disease, Chronic beryllium disease, Carcinogenicity); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources (Beryllium-copper alloys, Fluorescent tubes, Rocket fuels, Coals); Environmental air concentration; Abatement; Economics; Sampling methods; Quantitative methods (Morin fluorescent method, Colorimetric method, Spectrographic method).
PB-188 078 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF MANGANESE AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Ralph J. Sullivan. Sep 69, 63p*
Contract PH-22-68-25

Descriptors: (*Manganese, *Air pollution), (*Manganese compounds, Air pollution), (*Industrial medicine, Vanadium), Reviews, Toxicity, Oxides, Humans, Steel industry, Batteries+ components, Gasoline, Fuel additives, Animals, Manufacturing methods, Chemical analysis, Quantitative analysis.
Identifiers: Manganese oxides, Manganese steels.

Contents: Effects on humans (Chronic manganese poisoning; Manganic pneumonia); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrences; Production sources (Iron and steel industry, Coal, Fuel oil); Product sources (Dry-cell batteries, Chemicals); Environmental air concentrations; Economics; Methods of analysis (Sampling methods, Quantitative methods).
PB-188 079 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ASBESTOS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Ralph J. Sullivan, and Yanis C. Athanassiadis. Sep 69, 105p*
Contract PH-22-68-25

Descriptors: (*Asbestos, *Air pollution), (*Industrial medicine, Asbestos), Reviews, Toxicity, Humans, Animals, Cancer, Respiratory diseases, Plants (Botany), Manufacturing methods.
Identifiers: *Asbestosis, Mesothelioma.

Contents: Effects on humans (Asbestosis, Pleural calcification and plaques, Cancer, 'Asbestos bodies'); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources; Environmental air concentrations; Abatement; Economics; Methods of analysis.
PB-188 080 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ALDEHYDES.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Quade R. Stahl. Sep 69, 149p*
Contract PH-22-68-25

Descriptors: (*Aldehydes, *Air pollution), (*Formaldehyde, Air pollution), (*Acroleins, Air pollution), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Irritating agents, Photochemistry, Exhaust gases, Diesel engines, Aircraft engines, Combustion products, Coal, Fuel oil, Refineries, Chemical analysis, Quantitative analysis.
Identifiers: *Photochemical reactions, Automobile exhaust, Natural gas, Spectroscopic analysis.

Contents: Aledhydes' effects on humans (Physiological effects, Annoyance effects); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Formaldehyde manufacture, Acrolein manufacture); Product sources; Other sources (Atmospheric photochemical reactions, Mobile combustion sources, Stationary combustion sources); Environmental air concentrations; Abatement; Economics; Methods of analysis.
PB-188 081 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF AMMONIA.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Sydney Miner. Sep 69, 51p*

Descriptors: (*Ammonia, *Air pollution), (*Industrial medicine, Ammonia), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Refineries, Economics, Combustion products, Economics, Incinerators, Monitors, Chemical analysis.
Identifiers: Scrubbers, Spectroscopic analysis.

Contents: Ammonia's effects on humans; Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Haber-bosch process, Coke plants, Oil refineries, Metallurgical and ceramic plants, Combustion processes); Product sources; Environmental air concentrations; Abatement; Economics; Methods of analysis.
PB-188 082 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF BARIUM AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Sydney Miner. Sep 69, 69p*
Contract PH-22-68-25

Descriptors: (*Barium, *Air pollution), (*Barium compounds, Air pollution), (*Industrial medicine, Barium), (*Fuel additives, Barium compounds), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Fuel oil.
Identifiers: Barite.

Contents: Effects on humans; Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Mining and milling of barite, Barium metal); Product sources (Ground barite, Principal barium compounds, Diesel fuel additives); Abatement; Economics; Methods of analysis.
PB-188 083 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF BIOLOGICAL AEROSOLS (MICROORGANISMS).
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Harold Finkelstein. Sep 69, 109p*
Contract PH-22-68-25

Descriptors: (*Microorganisms, *Air pollution), Bacterial aerosols, Diseases, Effectiveness, Humans, Animals, Plants (Botany), Respiratory diseases, Influenza virus, Materials, Mycobacterium tuberculosis, Cholera, Newcastle disease virus, Control, Sampling, Analysis.

Biological aerosols--suspensions of microorganisms in the air--can cause diseases in humans, animals, and plants and degradation of inanimate materials. The present knowledge pertaining to the relationships between dose-effect, viability, survival of microorganisms in aerosols, and other factors is insufficient for establishing standards for either indoor or outdoor environmental air concentrations. The source of most human and animal airborne pathogens is the host organism that recently harbored the pathogens. However, since biological aerosols generally are detrimentally affected by exposure to the atmosphere, they are usually found in spaces close to the host. The abatement and control of biological aerosols have been successful only in environmentally-controlled indoor spaces. There has been no adequate way to estimate either the cost of the effects of biological aerosols, or the cost of abatement and control. (Author)
PB-188 084 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF BORON AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Norman L. Durocher. Sep 69, 55p*
Contract PH-22-68-25

Descriptors: (*Boron, *Air pollution), (*Boranes, Air pollution), (*Borates, Air pollution), (*Borides, Air pollution), (*Industrial medicine, *Boron compounds), Reviews, Toxicity, Animals, Humans, Plants (Botany), Refining (Metallurgy), Diboranes, Pentaboranes, Decaboranes, Refractory materials, Chemical analysis, Monitors, Fuel additives, Coal, Exhaust gases, Boric acids.
Identifiers: *Borax, *Boron oxides, Automobile exhaust, Tetraborane (10).

Contents: Boron's and boron compounds' effects on humans (Boranes, Boric acid, Sodium borates, Boron oxide, Other boron compounds); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrences; Production sources; Product sources (Boron oxide, Boric acid, Borates, Boric acid esters, Refractory boron compounds, Boron halides, Diborane, Tetraborane, Pentaborane, Decaborane); Environmental air concentrations; Abatement; Methods of analysis.
PB-188 085 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF CADMIUM AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Yanis C. Athanassiadis. Sep 69, 92p*
Contract PH-22-68-25

Descriptors: (*Cadmium, *Air pollution), (*Cadmium compounds, Air pollution), (*Industrial medicine, Cadmium), Reviews, Toxicity, Humans, Animals, Respiratory diseases, Cardiovascular system, Cancer, Plants (Botany), Manufacturing methods, Chemical analysis.
Identifiers: Emphysema.

Contents: Effects on humans (Respiratory systems, Cardiovascular system, Carcinogenesis); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources; Environmental air concentrations; Abatement; Economics; Methods of analysis.
PB-188 086 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF CHLORINE GAS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Quade R. Stahl. Sep 69, 90p*
Contract PH-22-68-25

Descriptors: (*Chlorine, *Air pollution), (*Industrial medicine, Chlorine), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Electrolysis, Electrolytic cells, Organic solvents, Chemical analysis, Quantitative analysis.
Identifiers: Scrubbers, Air pollution control equipment, Spectroscopic analysis.

Contents: Chlorine gas' effects on humans (Acute effects, Chronic effects, Sensory thresholds, Synergistic effects, Chlorine gas exposure to communities through accidents); Effects on animals; Effects on plants (Phytotoxicity, Sensitivity of plants, Effect of moisture, Effect of light, Effect of water stress, Plant accumulations, Episodes of plant damage); Effects on materials; Environmental air standards; Natural occurrence; Production sources (Electrolytic diaphragm cells, Electrolytic mercury cells, Fusion electrolysis of chloride salts); Product sources (Chlorinated organic chemicals, Other organic chemicals, Inorganic chemicals); Environmental air concentrations; Abatement (Water scrubbers, Alkali scrubbers, Carbon tetrachloride scrubbers); Economics; Methods of analysis.
PB-188 087 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF IRON AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Ralph J. Sullivan. Sep 69, 106p*
Contract PH-22-68-25

Descriptors: (*Iron, *Air pollution), (*Iron compounds, Air pollution), (*Iron industry, Air pollution), (*Industrial medicine, Air pollution), Reviews, Toxicity, Humans, Animals, Plants (Botany), Blast furnaces, Incinerators, Coal, Fuel oil, Fuel additives, Exhaust gases, Monitors, Chemical analysis, Cancer.
Identifiers: Automobile exhaust, Spectroscopic analysis.

Contents: Iron's and iron compounds' effects on humans: (Carcinogenesis, Synergism, Nutrition, Iron pentacarbonyl); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Iron and steel industry, Coal, Fuel oil); Product sources (Incineration, Welding rods, Antiknock compounds); Environmental air concentrations; Abatement (Iron and steel industry); Economics; Methods of analysis.
PB-188 088 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ODOROUS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Ralph J. Sullivan. Sep 69, 258p*
Contract PH-22-68-25

Descriptors: (*Odors, *Air pollution), (*Exhaust gases, Odors), (*Smell, Odors), Reviews, Chemical industry, Paper industry, Coal, Iron industry, Food, Meat, Diesel engines, Petroleum industry, Aircraft engines, Sewage, Sensory mechanisms, Toxicity, Humans, Animals, Plants (Botany), Gas detectors, Economics, Chemical analysis, Gas chromatography.
Identifiers: *Odor control, *Odor detection, Coke, Food processing, Automobile exhaust, Kraft paper.

Contents: Odorous compounds' effects on humans (Characteristics of odors, Physiological and psychological, Theories of olfaction); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Petroleum industry, Petrochemical plant complexes, Chemical industry, Pulp and paper mills, Coke ovens and coal, Iron-steel industry and foundries, Food processing, Meat industry); Other sources (Diesel engine odors, Aircraft odors, Sewage); Environmental air concentrations; Abatement (Petroleum industry, Chemical industry, Pulp and paper mills, Coke ovens and coal, Diesel engine odors, Meat industry, Sewage); Economics; Methods of analysis.
PB-188 089 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF ORGANIC CARCINOGENS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Douglas A. Olsen, and James L. Haynes. Sep 69, 131p*
Contract PH-22-68-25

Descriptors: (*Cancer, *Air pollution), (*Industrial medicine, Cancer), (*Polycyclic compounds, Air pollution), Reviews, Anthracenes, Phenanthrenes, N-heterocyclic compounds, O-heterocyclic compounds, Ketones, Peroxides, Toxicity, Humans, Animals, Plants (Botany), Chemical analysis, Gas chromatography, Thin layer chromatography, Exhaust gases, Combustion products.
Identifiers: *Carcinogens, *Aromatic polycyclic hydrocarbons, *Benzopyrenes, Automobile exhaust, Benzanthracenes, Benzofluoranthenes, Chrysenes, Dibenzochrysenes, Dibenzacridines, Benzoanthracenones.

Contents: Types of organic carcinogens (Polynuclear aromatic hydrocarbons, Polynuclear heterocyclics and oxygenated compounds, Alkylating agents); Organic carcinogens as cocarcinogens or anticarcinogens; Effects on humans (Particulate matter, Particle size, Irritants, Studies with biological material); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources; Environmental air concentrations; Abatement; Sampling methods; Extraction methods; Separation (Column chromatography, Thin-layer chromatography, Gas chromatography, Other techniques); Spectroscopic analysis.
PB-188 090 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF PESTICIDES.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Harold Finkelstein. Sep 69, 186p*
Contract PH-22-68-25

Descriptors: (*Air pollution, *Pesticides), (*Herbicides, Air pollution), (*Fungicides, Air pollution), (*Insecticides, Air pollution), (*DDT, Air pollution), Toxicity, Phosphates, Organic phosphorus compounds, Plants (Botany), Humans, Economics, Manufacturing methods, Quantitative analysis, Lethal dosage, Chlordane, Gas chromatography, Parathion, Inorganic compounds, Arsenic compounds, Carbamic acids, Naphthalenes, Triazines, Urea, Phenols, Sulfides.
Identifiers: *Chlorine organic compounds, Benzene/hexachloro, Aldrin, Dieldrin, Endrin, Hetachlor Strobane, Toxaphene, Malathion, 2-4 D herbicide, 3-4-5 T herbicide, Propionic acid/2- (2-4-5-trichlorophenoxy), Nitro compounds, Dimethanonaphthalenes, Phosphonates.

Contents: Effects on humans; Insecticide effects and toxicities (DDT group, Aldrin-toxaphene group, Benzene hexachloride group, Other chlorinated hydrocarbons, Organophosphates); Herbicide effects and toxicities; Fungicide effects and toxicities; Specific effects and case histories; Effects on animals; Effects on plants; Effect on materials; Environmental air standards; Natural occurrence; Production sources; Product sources; Environmental air concentrations; Abatement; Economics; Methods of analysis.
PB-188 091 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF RADIOACTIVE SUBSTANCES.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Sydney Miner. Sep 69, 159p*
Contract PH-22-68-25

Descriptors: (*Radioactive isotopes, *Air pollution), (*Radioactive waste, Air pollution), (*Nuclear power plants, Air pollution), Reviews, Radioactive fallout, Toxicity, Humans, Animals, Plants (Botany), Cancer, Combustion products, Dosimeters, Dose rate, Radiological dosage, Cosmic rays, Reactor fuels, Uranium, Refining (Metallurgy), Economics, Chemisorption, Filters (Fluid), Iodine, Tritium, Helium group gases, Reactor fuel processing, Monitors, Gas analysis.
Identifiers: Cataracts.

Contents: Radioactive substances' Effects on humans (Types of exposure, Biological effects (Somatic effects, Leukemia, Other cancers, Cataracts, Effect on life span), Genetic effects, Acute exposure), Effects on animals; Effects on plants; Effects on materials; Environmental air standards (Maximum permissible dose (MPD), Maximum permissible concentrations (MPC)); Natural occurrence (Radioactive dusts, Cosmic rays, Combustion emissions, Natural radioactivity); Production Sources (Production of nuclear fuel, Nuclear reactors, Fuel reporcessing, Nuclear power industry projections, Nuclear Tests); Product sources (Aerospace applications); Control of radioactive pollution (Limitation of the emission of radioactive pollutants, Containment, Dispersal); Location of facility site; Air cleaning methods (Radioactive particulates, Wet collection); Radioactive gases and vapors (Chemisorption and adsorption, Absorption, Delay in storage); Economics, Sampling methods (Filters, Impactors, Impingers, Settling Trays); Quantitative methods (Analysis of collected particulate samples for activity, Radioactive particle size analysis, Gases (Iodine, Tritium, Noble gases, Other radioactive gases), Air quality monitoring).
PB-188 092 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF VANADIUM AND ITS COMPOUNDS.
Technical rept.,
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
Yanis C. Athanassiadis. Sep 69, 105p*
Contract PH-22-68-25

Descriptors: (*Vanadium, *Air pollution), (*Vanadium compounds, Air pollution), (*Industrial medicine, Vanadium), Reviews, Toxicity, Humans, Animals, Vanadates, Ores (Metal sources), Plants (Botany), Coal, Processing, Oils, Cholesterol, Economics.

Identifiers: Vanadium oxides, Vanadium pentoxide, Vanadium chlorides, Vanadium carbides, Sodium vanadates.

Contents: Effects on humans; Effects on animals; Vanadium pentoxide; Vanadium trioxide; Vanadium chloride; Vanadium metal; Vanadium carbide; Ferrovanadium; Sodium metavanadate; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Recovery of vanadium-oxide from vanadium bearing ores, Production of vanadium metal, Vanadium-bearing alloys, Vanadium chemicals); Environmental air concentrations; Abatement; Economics; Methods of analysis (Colorimetric methods, Atomic absorption spectroscopy, Polarography, Emission spectrography).
PB-188 093 HC$3.00 MF$0.65

STOCHASTIC MODELS FOR BIOCHEMICAL OXYGEN DEMAND AND DISSOLVED OXYGEN IN ESTUARIES,
Virginia Polytechnic Inst., Blacksburg. Water Resources Research Center.
For primary bibliographic entry see Field 8H.
PB-188 094 HC$3.00 MF$0.65

GENERALIZED INITIAL CONDITIONS FOR THE STOCHASTIC MODEL FOR POLLUTION AND DISSOLVED OXYGEN IN STREAMS.
Virginia Polytechnic Inst., Blacksburg. Water Resources Research Center.
For primary bibliographic entry see Field 8H.
PB-188 095 HC$3.00 MF$0.65

CONTINUOUSLY - REINFORCED CONCRETE PAVEMENT OBSERVATION PROGRAM IN MISSISSIPPI.
Annual progress rept. no. 2,
Mississippi State Highway Dept. Research and Development Div.
T. C. Teng. 1969, 60p
Prepared in cooperation with Bureau of Public Roads, Washington, D.C. See also annual progress rept. no. 1, PB-179 881.

Descriptors: (*Roads, Mississippi), (*Pavements, *Reinforced concrete), Design, Cracks, Statistical analysis, Deterioration, Traffic, Maintenance, Construction.
Identifiers: *Continuous pavements.

The report covers the second year of a five year observation study of continuouslyreinforced concrete pavement construction in Mississippi. Measurements from the Desoto County and Jones County experimental projects constructed in 1961 and 1962 were continued. Their design features, data on end movement, crack width and crack frequency are presented and discussed. A preliminary review of the design and construction statistics and the state-wide crack survey of all completed projects was made. (Author)
PB-188 102 HC$3.00 MF$0.65

FEASIBILITY STUDY FOR THE DEVELOPMENT OF A MULTIFUNCTIONAL EMISSION DETECTOR FOR NO, CO, AND SO2.
Monsanto Research Corp., Dayton, Ohio. Dayton Lab.
For primary bibliographic entry see Field 14B.
PB-188 103 HC$3.00 MF$0.65

FEASIBILITY STUDY FOR THE DEVELOPMENT OF A MULTIFUNCTIONAL EMISSION DETECTOR FOR AIR POLLUTANTS BASED ON HOMOGENEOUS CHEMILUMINESCENT GAS PHASE REACTIONS.
AeroChem Research Labs., Inc., Princeton, N.J.
For primary bibliographic entry see Field 14B.
PB-188 104 HC$3.00 MF$0.65

THE EFFECTS OF WAVES AND CURRENTS ON SUBMERGED PIPELINES,
Texas Engineering Experiment Station, College Station. Coastal and Ocean Engineering Div.
Derwood O. Ralston, and John B. Herbich. Mar 69, 128p* Sea Grant Pub-301, COE-101
Grant NSF-GH-26

Descriptors: (*Ocean waves, *Pipes), Deep submergence, Ocean currents, Design, Seacoast, Failure (Mechanics), Maintenance, Costs, Sedimentation, Petroleum industry, Environment, Corrosion, Reviews.
Identifiers: *Underwater pipelines.

The report is a brief review and summary of selected literature pertaining to the effects of waves and currents on submerged pipe lines. (Author)
PB-188 106 HC$3.00 MF$0.65

DEMAND FOR INDUSTRIAL LAND, 1968 - 1990.
Planning Guide no. 5.
Metropolitan Planning Commission-Kansas City Region, Mo.

Jul 69, 255p
Sponsored by Dept. of Housing and Urban Development, Washington, D.C.

Descriptors: (*Urban planning, *Handbooks), (*Industrial plants, *Site selection), (*Missouri, Industries), Employment, Predictions, Classification, Standards, Urban areas, Statistical data, Reviews, Population, Economics, Advanced planning, Kansas.
Identifiers: (*Kansas City (Missouri), Demand (Economics), Land use.

The report is based on projections of employment presented in an earlier Metroplan report containing preliminary analysis of the economy in the Kansas City region. The report reconsiders these employment projections in terms of: How much land will be needed by manufacturers who will provide the incremental employment; How much additional land will be needed by manufacturers presently operating in the region, but faced with a potential need to relocate; and What types of land will be needed. (Author)
PB-188 107 HC$3.00 MF$0.65

BIBLIOGRAPHY ON DREDGING,
Texas Engineering Experiment Station, College Station.
John B. Herbich, and R. H. Snider. Sep 69, 25p*
Sea Grant Pub-203
Grant NSF-GH-26

Descriptors: (*Civil engineering, *Bibliographies), (*Earth-handling equipment, Underwater), Pumps, Harbors, Minerals, Rivers, Ocean bottom sampling, Pipes, Transport properties, Centrifugal pumps, Petroleum industry, Turbopumps, Ships (Nonmilitary), Construction.
Identifiers: *Dredging, Underwater construction, Underwater excavation, Underwater pipelines.

The Bibliography contains 238 entries by author and is divided into five parts: Dredge pumps, Dredging vessels, Ocean mining, Pipeline transport, Miscellaneous references. (Author)
PB-188 109 HC$3.00 MF$0.65

PRIMI RISULTATI SULLIMPIEGO DI TRACCIANTI NELLA DETERMINAZIONE DI ALCUNE CARATTERISTICHE DI FUNZIONAMENTO DI UNITA PER IL TRATTAMENTO INTENSIVO DELLE ACQUE (Preliminary Experiments on the Application of Tracers for the Determination of Some Operational Characteristics of Solids-Contact Units for Water Treatment),
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
For primary bibliographic entry see Field 13H.
PB-188 131 HC$3.00 MF$0.65

WORK PROGRAMS FOR THREE STUDIES OF HOUSING IN THE COMPREHENSIVE PLAN.
National Association of Housing and Redevelopment Officials, Washington, D.C.

Nov 69, 84p* NAHRO-Pub-N537
Sponsored in part by the Department of Housing and Urban Development, Washington, D.C.

Descriptors: (*Housing, Management planning), (*Urban planning, Reviews), Organizations, Urban areas, Minnesota, Florida, Connecticut, Population, Site selection, Research program administration, Mobility, Pattern recognition, Problem solving, Terrain.
Identifiers: State programs, Objectives, Demand (Economics), Model cities, Minority groups, Low income groups.

The document is concerned with the need to devise methods by which housing goals can be formulated and implemented; to provide for a new relationship of comprehensive planning in metropolitan and state areas to new housing construction carried out by private or publicly-assisted interests; and to explore ways by which the housing 'program' function, related to urban renewal and minimum housing codes can be introduced in an integral way into a total development concept that also reflects the elements of comprehensive planning. (Author)
PB-188 134 HC$3.00 MF$0.65

RAPID MASS TRANSIT STUDY LOUISVILLE METROPOLITAN AREA.
Falls of the Ohio Metropolitan Council of Governments, Louisville, Ky.

22 Sep 69, 60p
Prepared in cooperation with De Leuw, Cather and Associates, Chicago, Ill. Sponsored in part by Dept. of Housing and Urban Development, Washington, D.C.

Descriptors: (*Transportation, *Kentucky), Feasibility studies, Urban areas, Roads, Traffic, Statistical analysis, Predictions, Costs, Site selection.
Identifiers: Rapid transit systems, *Louisville (Kentucky).

The report presents preliminary planning study of a rapid transit system to connect downtown Louisville and a limited number of outlying traffic generators with the principal residential areas of the metropolitan region. Consideration was given to possible rapid transit routes in eight sectors of the metropolitan area. Tentative locations were selected for each route, and estimates were made of the construction cost and potential patronage of appropriate facilities on each alignment. (Author)
PB-188 135 HC$3.00 MF$0.65

CONSTRUCTION OF A ROCK-FILL DAM BY LARGE-SCALE DIRECTIONAL DOWNTHROW BLASTS (Sooruzhenie Kamennonabrosnoi Plotiny s Primeneniem Massovykh Nepravlennykh Vzryvov na Sbros),
California Univ., Berkeley. Lawrence Radiation Lab.
R. V. Sedykh. Oct 69, 25p UCRL-Trans-10402
Trans. of Energeticheskoe Stroitelstvo (USSR) n85 p35-41 Jul 68, by J. Mulhaus.

Descriptors: (*Dams, Rock (Geology)), (*Mud, Control), Construction, Blast, Direction finding, Cratering, Drainage, Rivers, Safety, Experimental data, USSR.
Identifiers: Downthrow blasts, Rockfill dams, Translations, Mudflows, Medeo (USSR).

Large-scale cratering and downthrow blasts find wide application in the construction of hydraulic engineering works. The use of blast energy for the formation of the main body of a rock-fill dam is of great interest. A typical example of such operations, which has recently been completed, is the construction of a mudflow protection dam in the locality of Medeo near the town of Alma-Ata. (Author)
PB-188 149T HC$3.00 MF$0.65

JONESBORO LAND USE PLAN: JONESBORO, TENNESSEE.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.

Jul 69, 83p
Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only. PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Urban planning, *Tennessee), Terrain, Management planning, Population, Predictions, Economics, Reviews, Rural areas.
Identifiers: *Jonesboro (Tennessee), Land use, Population trends, Economic trends.

The land use plan of Jonesboro consists of preliminary studies, which include an evaluation of physical features, an analysis of existing and possible future trends in population and economic development, and an analysis of existing land uses. Based on these preliminary studies, the future land use plan was developed. (Author)
PB-188 157 HC$3.00 MF$0.65

ROADMAKING MATERIALS AND PAVEMENT DESIGN IN TROPICAL AND SUB-TROPICAL COUNTRIES,
Road Research Lab., Crowthorne (England).
M. P. O'Reilly, and R. S. Millard. 1969, 43p* RRL-LR279

Descriptors: (*Roads, *Tropical regions), (*Pavements, Design), Construction, Rural areas, Bituminous coatings, Thickness, Soils, Maintenance, Budgets, Traffic, Flexible structures, Concrete, Gravel, Rock (Geology), Great Britain.
Identifiers: Unimproved roads.

The report discusses the selection of roadmaking materials and the design of road pavements in tropical and sub-tropical countries for roads in rural areas ranging form rudimentary tracks to bituminous-surfaced main highways. The properties required in road sub-bases, bases and surfacings are reviewed with emphasis on the use of materials available locally in these regions. Recommendations are made for the selection of pavement thicknesses in terms of traffic loading and the strength of the soil subgrade. The report concludes by considering how stage construction should be planned and the organisation and financing of road maintenance. (Author)
PB-188 158 HC$3.00 MF$0.65

SLOPE STABILITY INVESTIGATION OF RESIDUAL CLAY SOILS OF SOUTHEASTERN OHIO.
Ohio State Univ., Columbus. Engineering Experiment Station.
For primary bibliographic entry see Field 8G.
PB-188 185 HC$3.00 MF$0.65

STUDY OF COMPRESSIVE STRENGTHS OF PORTLAND CEMENT CONCRETE TEST CYLINDERS.
Maine State Highway Commission. Materials and Research Div.
For primary bibliographic entry see Field 13M.
PB-188 186 HC$3.00 MF$0.65

EXPERIMENTAL CONTINUOUSLY REINFORCED CONCRETE PAVEMENT STUDY ROUTE I-84 SOUTHINGTON.
Final rept.,
Connecticut State Highway Dept. Div. of Research and Development.
Fred Sternberg. Jun 69, 91p
Report on Performance of Continuously Reinforced Concrete Pavement I-84 Southington. Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Roads, *Connecticut), (*Pavements, Reinforced concrete), Steel, Configuration, Design, Cracks, Deterioration, Maintenance.
Identifiers: *Continuous pavements.

The report is a summary of the field observations and failures which have occurred to date on the experimental continuously reinforced concrete pavement. The failures of the wire mesh reinforcement over the past three years are covered in considerable detail. The experimental pavement was opened to traffic in December 1962. The project is a six-lane divided highway and is part of Interstate 84 which begins at the New York State Line and ends at the Massachusetts State Line. (Author)
PB-188 187 HC$3.00 MF$0.65

CONTINUOUS MICROBIOLOGICAL PURIFICATION OF WASTE-WATER FROM PAPER AND WALLBOARD INDUSTRIES,
Acta Polytechnica Scandinavica, Stockholm (Sweden).
For primary bibliographic entry see Field 6M.
PB-188 194 HC$3.00 MF$0.65

A DEFINITION OF ORGANIC SOILS. AN ENGINEERING IDENTIFICATION,
Louisiana State Univ., Baton Rouge, Division of Engineering Research.
Ara Arman. Oct 69, 198p* Engineering-Research-bull-101

Descriptors: (*Civil engineering, Soils), (*Soils, Identification), Physical properties, Classification, Design, Foundations (Structures), Organic materials, Soil mechanics, Flexural strength, pH, Water, Absorption, Performance (Engineering), Mixtures, Regression analysis, Compressive properties.
Identifiers: Organic soils.

Classification systems have been used to correlate the physical properties of a soil with its structural performance. Because no extensive engineering classification system exists for organic soils, uncertainty reigns in the design of structures founded on these materials. In this study the physical properties of organic soils were evaluated by an extensive testing program as a general approach to an engineering classification system. Several previously unknown characteristics of organic soils were found. Following a comprehensive literature search concerning the physical characteristics of organic soils, laboratory testing evaluated their engineering characteristics. One of the conclusions drawn from this study is that soils which contain up to 20 percent organic material may be used as foundation material without ill effects. A correlation was established between water content, water absorption, and pH of organic soils. The present-day combustion methods of determining organic content are in error. (Author)
PB-188 195 HC$3.00 MF$0.65

SKETCH PLAN 1990.
Planning Guide no. 4.
Metropolitan Planning Commission-Kansas City Region, Mo.

Dec 68, 63p
Prepared in cooperation with Dept. of Housing and Urban Development, Washington, D.C.

Descriptors: (*Urban planning, *Missouri), (*Kansas, Urban planning), Predictions, Urban areas, Population, Construction, Housing, Employment, Airports, Commerce, Economics, Transportation.
Identifiers: Land use, Area planning and development, *Kansas City (Kansas), *Kansas City (Missouri).

The 1990 Sketch Plan was prepared as an interim guide for urban development and as a preliminary indication of desirable land use projection to be utilized for transportation studies. It is not intended to be a final product, but rather an interim planning statement from which continued and coordinated studies may find a common base for all jurisdictions of the region. (Author)
PB-188 196 HC$3.00 MF$0.65

MOTOR TRUCKS IN THE METROPOLIS.
Automobile Manufacturers Association, Detroit, Mich.
For primary bibliographic entry see Field 13F.
PB-188 198 MF$0.65

EXISTING LAND USE AND FUTURE LAND USE PLAN: JASPER, TENNESSEE.
Tennessee State Planning Commission, Chattanooga. Southeast Regional Office.

Sep 69, 70p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. Limited number of copies containing color other than black and white are available until stock is exhausted. Productions will be made in black and white only.

Descriptors: (*Urban planning, *Tennessee), Terrain, Reviews, Predictions, Classification, Management planning, Soils, Sociometrics, Economics.
Identifiers: *Jasper (Tennessee), Land use.

Beginning with an analysis of the existing land uses in Jasper, the town is divided into three neighborhoods and a central business district. These areas are then discussed in detail, giving strict attention to present land uses and their suitability in the area described. (Author)
PB-188 199 HC$3.00 MF$0.65

SUMMARY OF JONESBORO LAND USE PLAN.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.

Jul 69, 18p

Descriptors: (*Urban planning, *Tennessee), Terrain, Population, Economics, Money, Commerce, Classification, Roads, Management planning.
Identifiers: *Jonesboro (Tennessee), Land use.
PB-188 201 HC$3.00 MF$0.65

COMPREHENSIVE PLAN, SWEETWATER, TENNESSEE, 1969-1990.
Tennessee State Planning Commission, Knoxville. East Tennessee Office.

Aug 69, 214p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Urban planning, *Tennessee), Terrain, Transportation, Sociometrics, Budgets, Population, Economics, Statistical data, Standards, Predictions.
Identifiers: *Sweetwater (Tennessee), Land use, Community facilities, Public improvements.

The document contains a revision and consolidation of the various planning elements which have previously been prepared for the city of Sweetwater. Included is a summary of the 1966 population and economy report, and an inventory and analysis of existing land uses, transportation, and community facilities within the area. (Author)
PB-188 202 HC$3.00 MF$0.65

BIOLOGICAL EFFECTS OF OIL POLLUTION. BIBLIOGRAPHY. A COLLECTION OF REFERENCES CONCERNING THE EFFECTS OF OIL ON BIOLOGICAL SYSTEMS.
Federal Water Pollution Control Administration, Washington, D.C.
For primary bibliographic entry see Field 6F.
PB-188 206 HC$3.00 MF$0.65

OIL DISPERSING CHEMICALS. A STUDY OF THE COMPOSITION, PROPERTIES AND USE OF CHEMICALS FOR DISPERSING OIL SPILLS.
Water pollution control research series,
Federal Water Pollution Control Administration, Edison, N.J. Water Quality Lab.
Melvin Z. Poliakoff. May 69, 33p* W70-02037
Contract DI-14-12-549

Descriptors: (*Oils, *Water pollution), (*Petroleum, Water pollution), (*Surface-active substances, Oils), State-of-the-art reviews, Colloids, Cleaning compounds, Fatty acids, Sulfonates, Phosphates, Alcohols, Esters, Phenols, Organic solvents, Standards, Chemical analysis.
Identifiers: *Oil pollution, Oil spills, *Emulsifying agents, Detergents, *Dispersants, Block copolymers, Benzene sulfonic acid/dodecyl- (sodium-salt).

A 'state-of-the-art' review is provided for chemicals which are used for dispersing spilled oil. Among the topics discussed are: the history of the development of oil spill dispersants; basic emulsion chemistry, including the nature and properties of surface active agents; chemical composition of oil spill dispersants, including a description of generic chemical types; production of dispersants, properties of dispersants; chemical analysis of oil spill dispersants; and the measurement of oil spill dispersing power. (Author)
PB-188 207 HC$3.00 MF$0.65

A MODEL FOR QUANTIFYING FLOW AUGMENTATION BENEFITS.
Florida Univ., Gainesville. Dept. of Environmental Engineering.
For primary bibliographic entry see Field 8H.
PB-188 208 HC$3.00 MF$0.65

ANALYSIS OF THE LOCATIONS AND FUNCTIONS OF THE TERMINAL INTERFACE SYSTEM.
Final rept. (Vol. 1).
Peat, Marwick, Livingston and Co., Boston, Mass.

Dec 69, 246p
Contract DOT-FR-9-0030
See also Volume 2, PB-188 210.

Descriptors: (*Urban areas, *Transportation), Site selection, Design, Configuration, Analysis, Operation, Mathematical models, Airports, Railroads, Vehicles.
Identifiers: Rapid transit systems, Tradeoffs, *Bus terminals, *Railroad terminals, *Terminal facilities.

The report summarizes the findings of a study of transportation terminal site-selection and design. The study focuses on the intra-city and inter-city passenger transportation modes. (Author)
PB-188 209 HC$3.00 MF$0.65

ANALYSIS OF THE LOCATIONS AND FUNCTIONS OF THE TERMINAL INTERFACE SYSTEM.
Final rept. (Vol. 2).
Peat, Marwick, Livingston and Co., Boston, Mass.

Dec 69, 205p
Contract DOT-FR-9-0030
See also Volume 1, PB-188 209.

Descriptors: (*Urban areas, *Transportation), Site selection, Design, Construction, Configuration, Analysis, Operation, Mathematical models, Airports, Railroads, Vehicles.
Identifiers: *Terminal facilities, Rapid transit systems, Bus terminals, Railroad terminals.
PB-188 210 HC$3.00 MF$0.65

STUDIES OF THE MEASUREMENT OF SULFUR DIOXIDE IN STACK GASES. THREE CONCURRENT STUDIES.
Industrial Nucleonics Corp., Columbus, Ohio.

29 Jan 68, 315p*
Contracts AT (30-1)-3882, AT (30-1)-3881
Prepared in cooperation with International Chemical and Nuclear Corp., Pittsburgh, Pa. Nuclear Science Div., and Texas Nuclear Corp., Austin.

Descriptors: (*Waste gases, Monitors), (*Air pollution, *Nuclear industrial applications), Chemical analysis, X-ray spectroscopy, Chemical reactions, Mercury compounds, Chlorides, Gas detectors.
Identifiers: *Sulfur dioxide, *Flue gases, *X-ray fluorescence, Mercury chlorides, Mercury sulfites.

For abstract, see NSA 23 23.
TID-25137 HC$3.00 MF$0.65

13C. Construction Equipment Materials, and Supplies

THE STRENGTH AND CREEP OF FROZEN SOILS AND CALCULATIONS FOR ICE-SOIL RETAINING STRUCTURES,
Cold Regions Research and Engineering Lab., Hanover, N.H.
For primary bibliographic entry see Field 8M.
AD-484 093 HC$3.00 MF$0.65

NATURAL WEATHERING OF MINERAL STABILIZED ASPHALT COATINGS ON ORGANIC FELT.
Building Science Series,
National Bureau of Standards, Washington, D.C. Building Research Div.
Sidney H. Greenfeld. Oct 69, 22p
Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.30.

Descriptors: (*Construction materials, Roofs), (*Bituminous coatings, Environmental tests), (*Asphalt, Environmental tests), Additives, Minerals, Life expectancy, Weatherproofing, Exposure, Aging (Materials), Deterioration, Performance (Engineering), Accelerated testing, Correlation techniques, Clay minerals, Mica, Silicon dioxide, Granules.
Identifiers: *Roofing, Weathering, Stabilizers (Agents), Slates, Dolomite (Mineral), Fly ash, Evaluation.

Sixteen years of outdoor weathering of laboratory-prepared smooth-surface and mineral-surfaced, felt-base roofing specimens has provided information on the effects of mineral additives on the durability of coating-grade roofing asphalts. Six finely divided mineral additives (blue black slate, clay, dolomite, fly ash, mica, and silica) were evaluated at concentrations up to 60 percent in California, Mid Continent and Venezuela asphalts. The mineral-surfaced specimens are all performing satisfactorily, and show only minor degrees of degradation. Of the smooth-surfaced specimens, the Mid-Continent asphalt performed the best and the California asphalt the poorest. The mica and blue black slate increased the durabilities of all three asphalts at all concentrations and two coating thicknesses. Fly ash, clay, dolomite, and silica were beneficial in some combinations, but had little effect in others. In general, these early results from outdoor exposure tend to corroborate the results obtained on these coatings exposed in weatherometers. (Author)
NBS-BSS-24 HC$0.30 MF$0.65

RIGIDITY OF 48 INCHES BY 40 INCHES DOUGLAS FIR LUMBER AND PLYWOOD PALLETS,
Virginia Polytechnic Inst., Blacksburg.
For primary bibliographic entry see Field 11L.
PB-188 001 HC$3.00 MF$0.65

EARLY TRAFFICKING OF THIN CONCRETE PATCHES,
Road Research Lab., Crowthorne (England).
For primary bibliographic entry see Field 13B.
PB-188 033 HC$3.00 MF$0.65

THE EFFECTS OF WAVES AND CURRENTS ON SUBMERGED PIPELINES,
Texas Engineering Experiment Station, College Station. Coastal and Ocean Engineering Div.
For primary bibliographic entry see Field 13B.
PB-188 106 HC$3.00 MF$0.65

BIBLIOGRAPHY ON DREDGING,
Texas Engineering Experiment Station, College Station.
For primary bibliographic entry see Field 13B.
PB-188 109 HC$3.00 MF$0.65

USER'S GUIDE FOR THE COMPUTER PROGRAM DESCRIBED IN TAM REPORT NO. 680 'DETERMINATION OF VOLUME CHANGE STRESSES IN PLAIN AND REINFORCED CONCRETE USING FINITE ELEMENT ANALYSIS',
Illinois Univ., Urbana. Dept. of Theoretical and Applied Mechanics.
For primary bibliographic entry see Field 9B.
PB-188 188 HC$3.00 MF$0.65

13D. Containers and Packaging

HYDROGEN FLUORIDE CYLINDER FAILURE,
Oak Ridge Gaseous Diffusion Plant, Tenn.
K. T. Ziehlke, G. S. Petit, E. Y. Kimmerly, and C. W. Weber. 16 Sep 69, 19p*
Contract W-7405-eng-26

Descriptors: (*Gas cylinders, *Explosions), (*High-pressure valves, *Corrosion), Fluorides, Hydrogen compounds.
Identifiers: *Hydrogen fluoride.

For abstract, see NSA 23 23.
K-1881 HC$3.00 MF$0.65

13E. Couplings, Fittings, Fasteners, and Joints

LOW-TEMPERATURE MECHANICAL PROPERTIES OF WELDED AND BRAZED COPPER. (C-3),
National Bureau of Standards, Boulder, Colo. Inst. for Basic Standards.
R. P. Reed. 1968, 5p R-529
Pub. in Advances in Cryogenic Engineering, v14 p83-87, Proceedings of the Cryogenic Engineering Conference, Cleveland, Ohio. 19-21 Aug 68.

Descriptors: (*Copper, *Metal joints), Low-temperature research, Welds, Brazing, Metal plates, Tensile properties, Shear stresses.

Butt-welded and brazed 1/4 in. thick plate of deoxidized high-purity copper with 1/8 and 1/4 in. overlaps were tested. Tensile and notched tensile tests were performed on the welded plate, and shear tests, pulled in tension, were conducted on the brazed overlap joints. (Author)
PB-188 219

13F. Ground Transportation Equipment

PRIMARY ENERGY STORAGE AND THE SUPER FLYWHEEL.
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
For primary bibliographic entry see Field 10C.
AD-697 906 HC$3.00 MF$0.65

GLASS FIBER REINFORCED PLASTIC PRESSURELESS TIRE.
Final rept.,
Owens-Corning Fiberglas Corp Granville Ohio Technical Center
James C. Hood. Oct 69, 70p* TACOM-TR-10696
Contract DAAE07-67-C-4319

Descriptors: (*Tires, *Filament wound construction), (*Reinforced plastics, Tires), Feasibility studies, Bonding, Plastics, Glass textiles, Reinforcing materials, Elastic shells, Loading (Mechanics), Laminates, Rubber coatings, Wear resistance, Life expectancy, Army research, Vehicles.
Identifiers: *Pressureless tires, Nonpneumatic tires, Shell theory, Fiberglass reinforced plastics.

The program sought to provide adequate data on which to base a judgment of the probability of success in producing a satisfactory glass fiber reinforced plastic pressureless tire by the filament winding method. The tire sought represents an entirely new and unique concept in automotive tires, and would be impossible to deflate. A process was developed to produce a preliminary model of a 7.00 x 16 tire. Several tire configurations were wound and tested statically, and dynamically on an indoor wheel. The feasibility of a glass fiber reinforced plastic pressureless tire was demonstrated. (Author)
AD-698 036 HC$3.00 MF$0.65

SUSPENSION FOR TRACKED VEHICLES,
Army Foreign Science and Technology Center Washington D C
V. V. Emelyanenko, R. V. Efimova, N. A. Litvinov, and E. R. Melman. 19 Nov 69, 6p Rept no. FSTC-HT-23-185-70
Trans. of Patent (USSR) 212 073.

Descriptors: (*Tracked vehicles, Suspension devices), Design, Configuration, USSR.
Identifiers: Translations, *Suspension systems (Vehicles).

A patent is described for a tracked vehicle suspension containing a transverse balance beam spring-supported by means of flat rubber elastic elements. The beam is hinged at the middle to the chassis of the vehicle and the ends rest on the track carriers. The design is simplified by mounting the balance beam on the midsection of a pivot, the ends of the pivot being rigidly fastened to the midsections of support beams whose ends rest on the chassis through elastic rubber elements. (Author)
AD-698 082 HC$3.00 MF$0.65

OVERVIEW OF INTERNATIONAL HIGHWAY SAFETY PROBLEMS.
Leasco Systems and Research Corp., Bethesda, Management Systems Group.
For primary bibliographic entry see Field 13L.
PB-187 861 HC$3.00 MF$0.65

REPORT ON THE RELATIONSHIP OF FARES, SERVICES AND COSTS FOR D. C. TRANSIT SYSTEM, INC.
Voorhees (Alan M.) and Associates, Inc., McLean, Va.

Nov 69, 91p AMV-R-70-1036

Descriptors: (*Transportation, *District of Columbia), (*Economics, Transportation), Passenger vehicles, Maryland, Costs, Cost effectiveness, Statistical analysis, Distribution (Economics).
Identifiers: DC Transit System, Buses (Vehicles), *Bus lines, Bus fares.

Contents: Background to the consultant assignment; The economic and legal concepts of discrimination in pricing transportation; Passenger groups used for analysis of D.C. transit service and fares; Measuring transit service as perceived by the passenger; Estimates of fares paid by each rider group; Comparison of fares with service used by riders; Estimating cost of service on each line; Alternative cost allocations compared with fares collected for each rider group.
PB-187 978 HC$3.00 MF$0.65

RHODE ISLAND TRANSIT PLAN: FUTURE MASS TRANSIT SERVICES AND FACILITIES FOR THE STATE OF RHODE ISLAND.
Rhode Island Statewide Comprehensive Transportation and Land Use Planning Program, Providence.

Jun 69, 135p Rept. no. 9

Descriptors: (*Management planning, *Rhode Island), (*Transportation, Urban areas), Rural areas, Decision making, Budgets, Economics, Traffic, Statistical data, Systems engineering, Organizations, Passenger vehicles, Railroads, Predictions.
Identifiers: Providence (Rhode Island), Express bus routes, Bus lines, *Area planning and development.

The report presents a two-phase transit development program which is a major part of the transportation element of the state's guide plan. It focuses attention on the need for a comprehensive approach and presents information required for decision making regarding the short range and long range allocation of financial and physical resources for mass transportation facilities. Existing transit operations are analyzed and proposals are made for bus route additions and modifications. (Author)
PB-187 993 HC$3.00 MF$0.65

TRANSPORTATION PLAN: SURGOINSVILLE, TENNESSEE.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.
For primary bibliographic entry see Field 13B.
PB-187 995 HC$3.00 MF$0.65

SURGOINSVILLE TRANSPORTATION PLAN: SUMMARY.
Tennessee State Planning Commission, Johnson City. Upper East Tennessee Office.
For primary bibliographic entry see Field 13B.
PB-187 996 HC$3.00 MF$0.65

ST. LOUIS METROPOLITAN AREA RAPID TRANSIT FEASIBILITY STUDY. PHASE II REPORT: ALTERNATIVE TRANSIT SYSTEMS.
East-West Gateway Coordinating Council, East St. Louis, Ill.

1969, 113P
Prepared in cooperation with Parsons, Brinckerhoff, Tudor, Bechtel, Sverdrup and Parcel, St. Louis, Mo.

Descriptors: (*Transportation, *Missouri), Feasibility studies, Urban areas, Management planning, Traffic, Roads, Passenger vehicles, Railroads, Costs, Construction, Maintenance, State-of-the-art reviews.
Identifiers: Saint Louis (Missouri), *Rapid transit systems, Alternatives.

The report is the second in a series to determine the feasibility of rapid transit in the St. Louis metropolitan area. The report discusses criteria suggested for use in further development of the study as well as several alternative transit system schemes. Basic to all schemes is the continuing use of busses either as feeders or as part of a collector system. A review of the current 'state of the art' of transit technology is also included. (Author)
PB-187 997 HC$3.00 MF$0.65

TRANSPORTATION PLAN, LENOIR CITY - LOUDON - LOUDON COUNTY, TENNESSEE.
Tennessee State Planning Commission, Knoxville. East Tennessee Office.
For primary bibliographic entry see Field 13B.
PB-188 004 HC$3.00 MF$0.65

RELATIONSHIP OF THE TIRE-PAVEMENT INTERFACE TO TRAFFIC ACCIDENTS OCCURRING UNDER WET CONDITIONS.
Texas Highway Dept.
For primary bibliographic entry see Field 13L.
PB-188 020 HC$3.00 MF$0.65

IMPROVEMENTS AND INNOVATIONS IN URBAN BUS SYSTEMS.
Organization for Economic Co-Operation and Development, Paris (France). Directorate for Scientific Affairs.
For primary bibliographic entry see Field 13B.
PB-188 030 HC$3.00 MF$0.65

MINICAR TRANSIT SYSTEM. FEASIBILITY STUDY. BOOK 2.
Final rept. on Phase 1.
Pennsylvania Univ., Philadelphia.

Dec 68, 141p*
See also Book 1, Summary, PB-184 147.

Descriptors: (*Passenger vehicles, Design), (*Transportation, Feasibility studies), Urban areas, Air pollution, Costs, Urban planning, Maintenance.
Identifiers: *Mass transportation, *Minicars.

The study has focused on the feasibility and desirability of introducing emission-limited, length-limited vehicles, within a rental-fleet context called The Minicar Transit System, into central parts of metropolitan areas. The test case, upon which these concepts were based, is designed for the Philadelphia Central Business District. The system includes a specially designed vehicle, unique parking and handling facilities, and full exploitation of state of the art technologies for cost reduction and system worthiness. It promises the user the immediate and direct benefit of lower cost when compared to the use of standard automobiles as well as improved convenience. It promises society an increase in street capacity and decreased pollution in direct proportion to the number of standard cars eliminated from central-city operation with the substitution of Minicars. (Author)
PB-188 046 HC$3.00 MF$0.65

COMPLIANCE TEST REPORT. TIRES UNIROYAL, SIZE 6.45-14, 8.25-14, 8.55-15, 8.25-14 Super Safety, Standard 109.
ETL, Inc., New York. Automotive Testing Div.

Oct 69, 26p* Test-795, Test-796
Contracts FH-11-6948, FH-11-6839
Prepared in cooperation with Automotive Research Associates, San Antonio, Tex. Also includes Test-797 and Test-229.

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards.
Identifiers: Evaluation, Failure analysis, Uniroyal tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 055 HC$3.00 MF$0.65

STEERING DIAGNOSIS: A STUDY OF DEGRADED COMPONENTS AFFECTING IN-USE VEHICLE HANDLING.
Final rept. - Phase 2 and Phase 2 Extension.
Clayton Mfg. Co., El Monte, Calif. Dynamometer Div.

11 Dec 69, 135p* HS-800 190
Contract FH-11-6629
See also Appendix, PB-188 058.

Descriptors: (*Passenger vehicles, *Safety), (*Steering, Vehicle chassis components), Handling, Degradation, Stability, Malfunctions, Diagnosis, Control systems, Performance (Engineering), Vehicle wheels, Vehicle brakes, Shock absorbers.

The purpose of the study was to determine the degradation of automobile steering system components as they affect the safe handling of the vehicle. This information will be used to improve the understanding of relationships between objective measures of vehicle instability, and specific malfunctions in the steering system. The study was also designed to propose techniques and equipment for the determination of the component degradation. (Author)
PB-188 057 HC$3.00 MF$0.65

STEERING DIAGNOSIS: A STUDY OF DEGRADED COMPONENTS AFFECTING IN-USE VEHICLE HANDLING. APPENDIX.
Final rept. - Phase 2 and Phase 2 Extension.
Clayton Mfg. Co., El Monte, Calif. Dynamometer Div.
11 Dec 69, 140p* HS-800 191
Contract FH-11-6629
See also Text, PB-188 057.

Descriptors: (*Passenger vehicles, *Safety), (*Steering, Vehicle chassis components), Handling, Degradation, Stability, Malfunctions, Diagnosis, Control systems, Performance (Engineering), Vehicle wheels, Vehicle brakes, Shock absorbers, Test methods, Test equipment.

Contents: Graphs of test data; Details of data analysis methods; Drawings and explanations of track and equipment; Methods of inducing malfunctions; Regarding of tests and sequences; Personnel and bibliography; Statement of work.
PB-188 058 HC$3.00 MF$0.65

DEFOG AND DEFROST SYSTEMS, VOLUME I.
Final rept.
Northern Research and Engineering Corp., Cambridge, Mass.
2 Jun 69, 325p* 1138-1 HS-800 192
Contract FH-11-6906
See also Volume 2, PB-188 060.

Descriptors: (*Passenger vehicles, Windshields), (*Windshields, Visibility), (*Safety devices, Standards), Safety, Performance (Engineering), Test methods, Vehicle heaters, Cooling+ ventilating equipment, Thermodynamics, Spark ignition engines, Mathematical models, Cargo vehicles, Jets, Coolants, Climatology, State-of-the-art reviews, Bibliographies, Abstracts.
Identifiers: *Defogging and defrosting systems, *Automotive engineering.

The work described involved the development of performance requirements from which federal performance standards can be established for motor vehicle defog-defrost systems, and the development of a test procedure and corresponding performance test criteria for determining compliance with established requirements. The work included a detailed literature survey for relevant information. The collected information and brief abstracts for each entry are presented. A thermodynamic model consisting of five subsystems was developed. This model represents both the transient and steady-state performance of the defog-defrost system as functions of vehicle characteristics and ambient and operating conditions and serves as a basis for the development of performance requirements and test criteria. An experimental apparatus was constructed and a limited test program was carried out to verify the thermodynamic model, to provide data about the defogging and defrosting capabilities of presently manufactured vehicles, and to furnish information for the development of performance requirements. (Author)
PB-188 059 HC$3.00 MF$0.65

DEFOG AND DEFROST SYSTEMS. VOLUME II. EXECUTIVE SUMMARY.
Northern Research and Engineering Corp., Cambridge, Mass.
30 Jul 69, 40p* 1138-2 HS-800 193
Contract FH-11-6906
See also Volume 1, PB-188 059.

Descriptors: (*Passenger vehicles, Windshields), (*Windshields, Visibility), (*Safety devices, Standards), Safety, Performance (Engineering), Test methods, Thermodynamics, Mathematical models, Cargo vehicles, Vehicle heaters, Cooling+ ventilating equipment, Climatology, Spark ignition engines, Jets, Coolants.
Identifiers: *Defogging and defrosting systems, Automotive engineering.

The work involved the development of performance requirements from which federal performance standards can be established for motor vehicle defog-defrost systems, and the development of a test procedure and corresponding performance test criteria for determining compliance with established requirements. (Dot abstracts)
PB-188 060 HC$3.00 MF$0.65

COMPLIANCE TEST REPORT--TIRES. GENERAL JET AIR II 7.00-13. STANDARD 109.
Automotive Research Associates, San Antonio, Tex.

Feb 69, 9p* Test-207

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards.
Identifiers: Evaluation, Failure analysis, General tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 121 HC$3.00 MF$0.65

COMPLIANCE TEST REPORT--TIRES. GOODYEAR CUSTOM POWER CUSHION 650-13. STANDARD 109.
Automotive Research Associates, San Antonio, Tex.

Feb 69, 10p* Test-213

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards.
Identifiers: Evaluation, Failure analysis, Goodyear tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 122 HC$3.00 MF$0.65

COMPLIANCE TEST REPORT--TIRES. MANSFIELD SAFE SERVICE 8.45-15. STANDARD 109.
Automotive Research Associates, San Antonio, Tex.

Feb 69, 11p* Test-224

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards.
Identifiers: Evaluation, Failure analysis, Mansfield tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 123 HC$3.00 MF$0.65

DOOR LATCH AND DOOR HINGE COMPLIANCE TESTS ON 1968 PONTIAC GRAND PRIX DOOR LATCHES AND DOOR HINGES, MANUFACTURED BY PONTIAC MOTOR DIVISION IN ACCORDANCE WITH 206,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Raymond W. Clarkson. 14 Apr 69, 18p* Test-690716
Contract FH-11-6871

Descriptors: (*Passenger vehicles, *Safety), (*Doors, *Mechanical fasteners), Vehicle chassis components, Tests, Standards, Loading (Mechanics), Failure (Mechanics).
Identifiers: *Latches, *Hinges, Evaluation, Pontiac Grand Prix automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 124 HC$3.00 MF$0.65

DOOR LATCH AND DOOR HINGE COMPLIANCE TESTS ON 1968 DODGE POLARA DOOR LATCHES AND DOOR HINGES, MANUFACTURED BY CHRYSLER CORPORATION IN ACCORDANCE WITH MVSS 206,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Raymond W. Clarkson. 14 Apr 69, 18p* Test-690715
Contract FH-11-6871

Descriptors: (*Passenger vehicles, *Safety), (*Doors, *Mechanical fasteners), Vehicle chassis components, Tests, Standards, Loading (Mechanics), Failure (Mechanics).
Identifiers: *Latches, *Hinges, Evaluation, Dodge Polara automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 125 HC$3.00 MF$0.65

DOOR LATCH AND DOOR HINGE COMPLIANCE TESTS ON 1968 MERCURY COLONY PARK DOOR LATCHES AND DOOR HINGES, MANUFACTURED BY FORD MOTOR COMPANY IN ACCORDANCE WITH MVSS 206,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Raymond W. Clarkson. 14 Apr 69, 18p* Test-690714
Contract FH-11-6871

Descriptors: (*Passenger vehicles, *Safety), (*Doors, *Mechanical fasteners), Vehicle chassis components, Tests, Standards, Loading (Mechanics), Failure (Mechanics).
Identifiers: *Latches, *Hinges, Evaluation, Mercury Colony Park automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 126 HC$3.00 MF$0.65

DOOR LATCH AND DOOR HINGE COMPLIANCE TESTS ON 1968 CADILLAC COUPE DEVILLE DOOR LATCHES AND DOOR HINGES, MANUFACTURED BY CADILLAC MOTOR CAR DIVISION IN ACCORDANCE WITH MVSS 206,
Brown (Dayton T.), Bohemia, N.Y. Testing Labs. Div.
Raymond W. Clarkson. 11 Apr 69, 18p* Test-690713
Contract FH-11-6871

Descriptors: (*Passenger vehicles, *Safety), (*Doors, *Mechanical fasteners), Vehicle chassis components, Tests, Standards, Loading (Mechanics), Failure (Mechanics).
Identifiers: *Latches, *Hinges, Evaluation, Cadillac Coupe Deville automobiles.

The report pertains to tests conducted by an independent constractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 127 HC$3.00 MF$0.65

BRAKE, TIRE AND RIM COMPLIANCE TEST ON ONE (1) 1968 AMERICAN AMX397 IN ACCORDANCE WITH MVSS 105 AND MVSS 110,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. 29 Jan 69, 70p* Test-TR-681909-Rev-A
Contract FH-11-6871

Descriptors: (*Passenger vehicles, *Safety), (*Vehicle brakes, Tests), (*Vehicle wheels, Tests), (*Tires, Tests), Standards, Road tests, Environmental tests, Loading (Mechanics), Performance (Engineering).
Identifiers: *Wheel rims, Evaluation, American AMX 397 automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 128 HC$3.00 MF$0.65

VEHICLE TEST REPORT FMVSS 204: 1969 VOLKSWAGEN MODEL 11, STEERING CONTROL REARWARD DISPLACEMENT.
Compliance test rept.
Digitek Corp., Marina del Rey, Calif.

Jul 69, 78p* 20301701/TR204-1
Contract FH-11-7301

Descriptors: (*Passenger vehicles, *Safety), (*Vehicle chassis components, Tests), Standards, Impact tests, Steering, Shafts, Control systems, Performance (Engineering).
Identifiers: Evaluation, Volkswagen automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 162 HC$3.00 MF$0.65

SEAT ANCHORAGE TEST ON ONE (1) 1969 CHEVROLET BEL AIR, NHSB NO. 69101 IN ACCORDANCE WITH FMVSS 207.
Compliance Test rept.,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. Oct 69, 20p* Test-691200
Contract FH-11-7184

Descriptors: (*Passenger vehicles, *Safety), (*Seats, *Anchors (Structural)), Standards, Failure (Mechanics), Impact, Tests, Loading (Mechanics).
Identifiers: Evaluation, Chevrolet Bel-Air automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 163 HC$3.00 MF$0.65

SEAT ANCHORAGE TEST ON ONE (1) 1969 MERCURY COUGAR, NHSB NO. 69201 IN ACCORDANCE WITH FMVSS 207.
Compliance test rept.,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. 15 Oct 69, 28p* Test-691199
Contract FH-11-7184

Descriptors: (*Passenger vehicles, *Safety), (*Seats, *Anchors (Structural)), Standards, Failure (Mechanics), Impact, Tests, Loading (Mechanics).
Identifiers: Evaluation, Mercury Cougar automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 164 HC$3.00 MF$0.65

SEAT ANCHORAGE TEST ON ONE (1) 1969 VOLKSWAGEN SEDAN, NHSB NO. 69501 IN ACCORDANCE WITH FMVSS 207.
Compliance test rept.,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. 8 Sep 69, 27p* Test-691198
Contract FH-11-7184

Descriptors: (*Passenger vehicles, *Safety), (*Seats, *Anchors (Structural)), Standards, Failure (Mechanics), Impact, Tests, Loading (Mechanics).
Identifiers: Evaluation, Volkswagen automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 165 HC$3.00 MF$0.65

VEHICLE TEST REPORT FMVSS 204: 1969 FIAT MODEL 850, STEERING CONTROL REARWARD DISPLACEMENT.
Compliance test rept.
Digitek Corp., Marina del Rey, Calif.

Sep 69, 58p* 20301701/TR204-2
Contract FH-11-7301

Descriptors: (*Passenger vehicles, *Safety), (*Vehicle chassis components, Tests), Standards, Impact tests, Steering, Shafts, Control systems, Performance (Engineering).
Identifiers: Evaluation, Fiat 850 automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 166 HC$3.00 MF$0.65

STEERING CONTROL REARWARD DISPLACEMENT. PERFORMANCE OF FMVSS 204 SAFETY STANDARD TESTS ON A 1969 CHRYSLER 300. NHSB 69302.
Compliance test rept. (Final).
Dynamic Science, Phoenix, Airz. AvSER Facility.

2 Oct 69, 62p*
Contract FH-11-7190

Descriptors: (*Passenger vehicles, *Safety), (*Vehicle chassis components, Tests), Standards, Impact tests, Steering, Shafts, Control systems, Performance (Engineering).
Identifiers: Evaluation, Chrysler 300 automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 167 HC$3.00 MF$0.65

FUEL TANKS, FUEL TANK FILLER PIPES, AND FUEL TANK CONNECTIONS. PERFORMANCE OF FMVSS 301 SAFETY STANDARD TESTS ON 1969 CHRYSLER 300. NHSB 69302.
Compliance test rept. (Final).
Dynamic Science, Phoenix, Ariz. AvSer Facility.

3 Oct 69, 60p*
Contract FH-11-7190

Descriptors: (*Passenger vehicles, *Safety), (*Vehicle chassis components, Tests), Standards, Impact tests, Fuel tanks, Pipes, Fittings, Leakage (Fluid).
Identifiers: Evaluation, Chrysler 300 automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 168 HC$3.00 MF$0.65

FUEL TANKS, FUEL TANK FILLER PIPES, AND FUEL TANK CONNECTIONS. PERFORMANCE OF FMVSS 301 SAFETY STANDARD TESTS ON A 1969 DODGE DART. NHSB 69301.
Compliance test rept. (Final).
Dynamic Science, Phoenix, Ariz. AvSER Facility.

25 Sep 69, 55p*
Contract FH-11-7190

Descriptors: (*Passenger vehicles, *Safety), (*Vehicle chassis components, Tests), Standards, Impact tests, Fuel tanks, Pipes, Fittings, Leakage (Fluid).
Identifiers: Evaluation, Dodge Dart automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 169 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) PHILLIPS 66, TEST NOS. D9S2041, D9S2042, IN ACCORDANCE WITH FMVSS 109.
Compliance test rept.,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. Oct 69, 47p* Test-691670, Test-691698
Contract FH-11-7184

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards.

Identifiers: Evaluation, Failure analysis, Firestone tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 170 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) GENERAL JET. TEST NOS. D9S2001, D9S2006, D9S2003A, D9S2005, AND D9S2008 IN ACCORDANCE WITH FMVSS 109.
Compliance test rept.,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. Sep 69, 120p* Test-691223, Test-691219
Contract FH-11-7184
Also includes Test-691220, Test-691224, and Test-691508.

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards.
Identifiers: Evaluation, Failure analysis, General tires.

The report pertains to tests conducted on General Jet 6.50 x 13 (4 ply), 7.35 x 14 (4 ply), and 7.75 x 14 (2 and 4 ply) tires by an independent contractor as part of the National Highway Safety Bureau compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 171 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) 1969 MOHAWK STORM TRACK, TEST NO. D9S2011 IN ACCORDANCE WITH FMVSS 109.
Compliance test rept.,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. Oct 69, 25p* Test-691584
Contract FH-11-7184

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards.
Identifiers: Evaluation, Failure analysis, Mohawk tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 172 HC$3.00 MF$0.65

FUEL TANKS, FUEL FILLER PIPE, AND FUEL TANK CONNECTIONS. PERFORMANCE OF FMVSS 301 SAFETY STANDARD TESTS ON A 1969 RAMBLER NHSB 69401.
Compliance test rept. (Final).
Dynamic Science, Phoenix, Ariz. AvSER Facility.

30 Sep 69, 60p*
Contract FH-11-7190

Descriptors: (*Passenger vehicles, *Safety), (*Vehicle chassis components, Tests), Standards, Impact tests, Fuel tanks, Pipes, Fittings, Leakage (Fluid).
Identifiers: Evaluation, Rambler automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 173 HC$3.00 MF$0.65

WINDSHIELD DEFROSTING AND DEFOGGING TEST ON ONE (1) 1969 BUICK, NHSB NO. 69102 IN ACCORDANCE WITH FMVSS 103.
Compliance test rept.,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. 21 Oct 69, 22p* Test-691195
Contract FH-11-7184

Descriptors: (*Passenger vehicles, *Safety), (*Windshields, Drying), (*Vehicle heaters, Environmental tests), Fog, Moisture, Ice, Performance (Engineering), Standards.
Identifiers: *Defrosting systems, *Defogging systems, Evaluation, Buick Special automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 174 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) BRIDGE STONE, TEST NO. D9S2051 IN ACCORDANCE WITH FMVSS 109.
Compliance test rept.,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. 30 Oct 69, 25p* Test-691703
Contract FH-11-7184

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards.
Identifiers: Evaluation, Failure analysis, Bridgestone tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 175 HC$3.00 MF$0.65

PASSENGER CAR PHEUMATIC TIRE TEST ON THREE (3) CO-OP CUSTOM SAFETY, TEST NO. D9S2031 IN ACCORDANCE WITH FMVSS 109.
Compliance test rept.,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. 17 Oct 69, 25p* Test-691652
Contract FH-11-7184

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards.
Identifiers: Evaluation, Failure analysis, Co-op tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 176 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) UNIROYAL, TEST NOS. D9S2034, D9S2023, D9S2038, D9S2039, D9S2024, D9S2021, D9S2027 IN ACCORDANCE WITH FMVSS 109.
Compliance test rept.,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. Oct 69, 164p* Test-691700, Test-691699
Contract FH-11-7184
Also includes Test-691701, Test-691704, Test-691653, Test-691587, Test-691654.

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards.
Identifiers: Evaluation, Failure analysis, Uniroyal tires.

The report pertains to tests conducted on Uniroyal 8.25 x 14 (2 ply), 8.55 x 14 (4 ply), G70 x 14 (2 and 4 ply), 8.25 x 15 (2 ply), 9.00 x 15 (2 ply), and F70 x 15 (4 ply tread, 2 ply sidewall) tires by an independent contractor as part of the National Highway Safety Bureau compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 177 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) SEARS ALLSTATE, MANUFACTURED BY ARMSTRONG TIRE AND RUBBER COMPANY. TEST NOS. D9S2017, D9S2015, D9S2014, D9S2016, D9S2019, D9S2018 IN ACCORDANCE WITH FMVSS 109.
Compliance test rept.,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
Edward S. Dale. Sep 69, 143p* Test-691511, Test-691586
Contract FH-11-7184
Also includes Test-691512, Test-691513, Test-691588, Test-691585.

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards.
Identifiers: Evaluation, Failure analysis, Armstrong tires, Allstate tires.

The report pertains to tests conducted on Armstrong-manufactured Sears Allstate 6.50 x 13 (4 ply), 6.95 x 14 (4 ply), 7.35 x 14 (4 ply), 7.75 x 14 (4 ply), and 7.75 x 14 (4 ply tread, 2 ply sidewall) tires by an independent contractor as part of the National Highway Safety Bureau compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 178 HC$3.00 MF$0.65

VEHICLE TEST REPORT FMVSS 301: 1969 VOLKSWAGEN MODEL 11, FUEL TANKS, FUEL FILLER PIPES, AND FUEL TANK CONNECTIONS.
Compliance test rept.
Digitek Corp., Marina del Rey, Calif.

Jul 69, 76p* 20301701/TR301-1
Contract FH-11-7301

Descriptors: (*Passenger vehicles, *Safety), (*Vehicle chassis components, Tests), Standards, Impact tests, Fuel tanks, Pipes, Fittings, Leakage (Fluid).
Identifiers: Evaluation, Volkswagen 1300 automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 180 HC$3.00 MF$0.65

VEHICLE TEST REPORT FMVSS 301: 1969 FIAT MODEL 850, FUEL TANKS, FUEL

FILLER PIPES, AND FUEL TANK CONNECTIONS.
Compliance test rept.
Digitek Corp., Marina del Rey, Calif.

Sep 69, 47p* 20301701/TR301-2
Contract FH-11-7301

Descriptors: (*Passenger vehicles, *Safety), (*Vehicle chassis components, Tests), Standards, Impact tests, Fuel tanks, Pipes, Fittings, Leakage (Fluid).
Identifiers: Evaluation, Fiat 850 automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 181 HC$3.00 MF$0.65

STEERING CONTROL REARWARD DISPLACEMENT. PERFORMANCE OF FMVSS 204 SAFETY STANDARD TESTS ON A 1969 RAMBLER NHSB 69401.
Compliance test rept. (Final).
Dynamic Science, Phoenix, Ariz. AvSER Facility.

Sep 69, 62p*
Contract FH-11-7190

Descriptors: (*Passenger vehicles, *Safety), (*Vehicle chassis components, Tests), Standards, Impact tests, Steering, Shafts, Control systems, Performance (Engineering).
Identifiers: Evaluation, Rambler automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 182 HC$3.00 MF$0.65

STEERING CONTROL REARWARD DISPLACEMENT. PERFORMANCE OF FMVSS 204 SAFETY STANDARD TESTS ON A 1969 DODGE DART NHSB 69301.
Compliance test rept. (Final).
Dynamic Science, Phoenix, Ariz. AvSER Facility.

26 Sep 69, 58p*
Contract FH-11-7190

Descriptors: (*Passenger vehicles, *Safety), (*Vehicle chassis components, Tests), Standards, Impact tests, Steering, Shafts, Control systems, Performance (Engineering).
Identifiers: Evaluation, Dodge Dart automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-188 183 HC$3.00 MF$0.65

MOTOR TRUCKS IN THE METROPOLIS.
Automobile Manufacturers Association, Detroit, Mich.

Aug 69, 232p
Paper copy available from Automobile Manufacturers Association, Inc., 320 New Center Bldg., Detroit Mich.

Descriptors: (*Transportation, Urban areas), (*Cargo vehicles, *Urban areas), Commerce, Traffic, Roads, Statistical analysis, Urban planning.

The study is an inquiry into urban truck travel as it relates to commodity and service requirements. Primary emphasis is given to the magnitude, character, and implication of daily motor truck travel. These patterns, in turn, have been analyzed in relation to other forms of travel on streets and highways and to planning criteria which relate to these facilities. The study endeavors to quantify urban goods linkages as inferred by truck travel and to define the accompanying needs in highway, terminal, and associated auxiliary facilities. (Author)
PB-188 198 MF$0.65

13G. Hydraulic and Pneumatic Equipment

HYDRAULIC AMPLIFIER,
Army Foreign Science and Technology Center Washington D C
A. A. Lyubimov, E. D. Magner, and M. V. Shevyakov. 19 Nov 69, 7p Rept no. FSTC-HT-23-199-70
Trans. of Patent (USSR) 217 764, 29 Jul 68.

Descriptors: (*Fluid amplifiers, Patents), Hydraulic systems, Hydraulic fluids, Pressure, Drainage, Membranes, USSR.
Identifiers: *Hydraulic amplifiers, Translations.

The proposed hydraulic amplifier differs from those already known for increasing accuracy, simplifying the design and ensuring the independence of the output parameter from a change in pressure and drainage head; the throttle valve in it is incorporated in a movable housing which is moved by an eccentric relative to the two-membrane unit; the rigid centers of the unit membranes are connected by a fixed rectangular frame with rods, on the lower of which acts a compensating membrane (or other sensing element), pressed between the moving housing of the throttle valve and the cover. (Author)
AD-698 166 HC$3.00 MF$0.65

HYDRAULIC TRANSMISSIONS,
Army Foreign Science and Technology Center Washington D C
V. K. Shlykov, and G. M. Khurshudyan. 19 Nov 69, 7p Rept no. FSTC-HT-23-186-70
Trans. of Patent (USSR) 209 520.

Descriptors: (*Transmissions, *Hydraulic systems), Railroads, Transmissions, Gears, Turbine parts, Hydraulic fluids, Patents, USSR.
Identifiers: *Fluid drives, Translations.

Hydraulic transmissions for railroad trains, consisting of a closed pair of gears, a reversing reducter and two coaxial hydraulic converters rotating in one direction, the pump wheels of which are mounted on a common shaft with all of the parts being enclosed in a single block are known to exist. The common shaft is connected to the engine. The turbine wheels are mounted on a common hollow shaft which encloses the pump shaft.
AD-698 169 HC$3.00 MF$0.65

FLUID LOGIC.
La Logique A Fluide
Commissariat A L Energie Atomique, Grenoble (France). Centre D Etudes Nucleaires.
R. Lancon. Jun 69, 37p CEA-BIB-165
Lang- in French, English Summary

Descriptors: *Binary fluids, *Fluid logic, *Fluidics, Automatic control valves, Boolean algebra, Coanda effect, Fluid jets, Jet vanes, Turbulent jets.

For abstract, see STAR 07 24.
N69-40224 HC$3.00 MF$0.65

13H. Industrial Processes

DIFFUSION SILICONIZING OF MOLYBDENUM, TUNGSTEN, AND NIOBIUM IN MOLTEN SALTS,
Foreign Technology Div Wright-Patterson AFB Ohio
A. I. Anfinogenov, N. G. Ilyushchenko, G. I. Belyaeva, and S. D. Finkelshtein. 8 Sep 69, 11p Rept no. FTD-HT-23-440-69
Edited trans. of Akademiya Nauk SSSR. Uralskii Filial, Sverdlovsk. Institut Elektrokhimii. Trudy, n11 p67-73 1968, by D. Koolbeck.

Descriptors: (*Refractory metals, *Silicon coatings), (*Diffusion coating, Refractory metals), Corrosion inhibition, Molybdenum, Tungsten, Niobium, Silicides, Corrosion resistance, Salts, Silicates, Fluorides, Sodium compounds, Potassium compounds, Sodium chloride, Chlorides.
Identifiers: Translations, Fused salts, Sodium fluorides, Silicate/hexafluoro, Sodium hexafluorosilicate, Potassium chloride.

The report concerns siliconizing (siliciding) of Mo, W, and Nb in molten salts in an argon atmosphere. The obtained coatings were studied metallographically and by X-ray diffraction methods (in the latter case, only for silicide coatings on molybdenum). Data on coating thickness and weight increments, along with results of tests for oxidation resistance, are presented. (Author)
AD-697 919 HC$3.00 MF$0.65

THE EFFECT OF SURFACE FINISHING ON STRUCTURAL-CERAMIC FAILURE.
Naval Research Lab Washington D C
For primary bibliographic entry see Field 11B.
AD-697 923 HC$3.00 MF$0.65

CATHODIC REDUCTION OF CUPROUS OXIDE IN VINYL ANTIFOULING PAINTS,
Defence Research Establishment Pacific Victoria (British Columbia)
W. A. Anderton. 17 Mar 69, 17p Rept no. Reprint-69-4
Availability: Pub. in Jnl. of the Oil and Colour Chemists' Association, v52 p711-726 1969. No copies furnished.

Descriptors: (*Cathodic protection, *Antifouling coatings), (*Copper compounds, *Reduction (Chemistry)), Paint primers, Copper, Vinyl plastics, Electrochemistry, Ship hulls.
Identifiers: Copper oxides.

On the cathodically protected bottoms of Canadian naval ships, when coated with a vinyl system including a cuprous oxide pigmented antifouling paint, black patches are frequently observed. It has been shown that these patches are electrically conductive and that the colour is the result of the reduction of cuprous oxide to metallic copper. This phenomenon is of practical importance because these areas transmit a relatively large cathodic current, with the possible consequence that the cathodic protection system may be unable to supply sufficient current for complete protection of the hull. The metallic copper, being cathodically protected, will not go into solution and so fouling may occur. Cathodic deposit on the conductive areas may increase the drag on the ship. A mechanism for this phenomenon is described. Experimental work has shown the conditions under which it occurs, and how it may be lessened. (Author)
AD-698 013

PROSIM V INSTRUCTOR MANUAL.
Auburn Univ Ala
For primary bibliographic entry see Field 5A.
AD-698 041 HC$3.00 MF$0.65

DEPENDENCE OF STRUCTURE AND PROPERTIES OF TITANIUM ALLOY FORGINGS ON TEMPERATURE AND DEGREE OF DEFORMATION,
Army Foreign Science and Technology Center Washington D C
N. G. Evlanov, and G. S. Sakharov. 27 Oct 69, 229p Rept no. FSTC-HT-23-111-69
Trans. of Aviatsionnyi Tekhnologicheskii Institut, Moscow. Trudy (USSR) n69 p155-170 1968.

Descriptors: (*Titanium alloys, *Forging), Mechanical working, Stresses, Hardening, Wire, Stainless steel, Grain structures (Metallurgy), Aluminum alloys, Copper alloys, Heat-resistant metals+ alloys, USSR.
Identifiers: Translations.

The first section of this collection of articles deals with theoretical investigations of rolling, drawing and hardening processes of metal during cold plastic deformation. The second section is devoted to production technology involving granular materials based on aluminum and copper, while the last section deals with the production of high-durability semi-finished products manufactured from heat-resistant alloys. (Author)
AD-698 077 HC$3.00 MF$0.65

DIFFUSION WELDING IN A VACUUM,
Foreign Technology Div Wright-Patterson AFB Ohio
N. F. Kazakov. 13 Aug 69, 411p Rept no. FTD-MT-24-419-68
Edited machine trans. of mono. Diffusionnaya Svarka v Vakuume, Moscow, 1968 p1-332.

Descriptors: (*Pressure welding, Vacuum apparatus), (*Diffusion bonding, State-of-the-art reviews), Weldability, Welds, Diffusion, Automation, Tool steel, Heat-resistant metals+ alloys, Stainless steel, Magnetic alloys, Iron, Non-metals, Cermets, USSR.
Identifiers: *Diffusion welding, *Vacuum welding, Welding machines, Structural steels, Translations.

A method devised by the author for vacuum diffusion welding of various metals, alloys, and nonmetallic materials in different combinations is covered. Results of research conducted during development of the method are generalized. A discussion of the principles of diffusion is followed by detailed descriptions of design, construction, operation, and control of a number of welding units in use in the USSR. (Author)
AD-698 097 HC$3.00 MF$0.65

VACUUM DEPOSITION OF THIN FILMS,
Foreign Technology Div Wright-Patterson AFB Ohio
B. S. Danil'n. 15 Aug 69, 334p Rept no. FTD-MT-24-490-68
Edited machine trans. of mono. Vakuumnee Nanesenie Tonkikh Plenok, Moscow, 1967, p1-312.

Descriptors: (*Vapor plating, Vacuum apparatus), (*Films, Deposition), State-of-the-art reviews, Metal films, Semiconducting films, Dielectric films, Optical coatings, Sputtering, Sprays, Vacuum pumps, Evaporators, Thickness, Manufacturing methods, Integrated circuits, Microminiaturization (Electronics), Thin film storage devices, Superhigh frequency, Mass spectroscopy, Spectrum analyzers, USSR.
Identifiers: *Vapor deposition, Sprayers, Cathode sputtering, Pressure measurement, Translations.

The book deals with methods of obtaining and processing thin films, methods of measuring the deposition rate and thickness of thin-film layers, and the main fields of application of thin films. Vacuum requirements and the requirements for the composition of the residual medium in thermal evaporation and cathode sputtering are given, and modern methods of producing and measuring vacuums and the equipment used in obtaining thin films are described. (Author)
AD-698 108 HC$3.00 MF$0.65

DOSE-DEPTH DISTRIBUTIONS PRODUCED BY ELECTRONS IN MULTILAYER TARGETS,
Maryland Univ., College Park. Lab. for Radiation and Polymer Science.
Marcel J. Kneidler, and Joseph Silverman. 1968, 27p
Presented at the Symposium on Utilization of Large Radiation Sources and Accelerators in Industrial Processing, Munich (Germany) Aug 69.

Descriptors: (*Electron beams, *Manufacturing methods), (*Beta particles, Manufacturing methods), Dose rate.

For abstract, see NSA 23 23.
CONF-690805-3 HC$3.00 MF$0.65

SOLDERING PROBLEMS OF NIOBIUM, MOLYBDENUM, TANTALUM, AND TUNGSTEN REFRACTORY METALS.
Problemas Na Soldadura Dos Metais Refractarios Niobio, Molibdenio, Tantalo E Tungstenio
Junta de Energia Nuclear, Sacavem (Portugal). Laboratorio de Fisica E Engenharia Nucleares.
H. Carvalhinhos. 1968, 31p LFEN-NI.37/ALPHA/Lang- in Portuguese

Descriptors: *Arc welding, *Hardening (materials), *Refractory metals, Aging (metallurgy), Brazing, Gas welding, Mechanical properties.

For abstract, see STAR 07 24.
N69-40405 HC$3.00 MF$0.65

AN INVESTIGATION OF THE TRIMMING OF NICKEL CHROMIUM FILM RESISTORS BY DIAMOND TIP ULTRASONIC SCRIBING.
Signals Research and Development Establishment, Christchurch (England).
For primary bibliographic entry see Field 9A.
For abstract, see STAR 07 24.
N69-40417 HC$3.00 MF$0.65

STAINLESS PLATING OF HEAVY-GAUGE STEELS FINAL REPORT.
Ghent Univ. (Belgium). Neratoom, N. V., the Hague (Netherlands). Soudometal, S. A., Brussels (Belgium).
31 May 68, 74p EURAEC-2093
Contract EURATOM-008-63-12-TEEB (RD)
Tran- Transl. Into English From French Report Spon- Sponsored By Aec and Euratom Prep- Prepared for Aec and Euratom

Descriptors: *Fracture mechanics, *Plating, *Stainless steels, *Strip, Cracks, High speed.

For abstract, see STAR 07 24.
N69-41059 HC$3.00 MF$0.65

PRODUCTS LIABILITY - A DEMAND BIBLIOGRAPHY.
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
For primary bibliographic entry see Field 5B.
For abstract, see STAR 07 24.
N69-41140 HC$3.00 MF$0.65

SPEED EFFECTS ON BALL SPINNING TORQUE.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
M. W. Dietrich, D. P. Townsend, and E. V. Zaretsky. Nov 69, 18p NASA-TN-D-5527
Contract 126-15

Descriptors: *Balls, *Coefficients, *Elastohydrodynamics, *Spin dynamics, *Torque, *Velocity distribution, Predictions, Rotating bodies, Spin tests, Torquemeters.

For abstract, see STAR 07 24.
N69-41210 HC$3.00 MF$0.65

PRIMI RISULTATI SULLIMPIEGO DI TRACCIANTI NELLA DETERMINAZIONE DI ALCUNE CARATTERISTICHE DI FUNZIONAMENTO DI UNITA PER IL TRATTAMENTO INTENSIVO DELLE ACQUE (Preliminary Experiments on the Application of Tracers for the Determination of Some Operational Characteristics of Solids-Contact Units for Water Treatment),
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
G. Branca. 1969, 30p RT/PROT (69)24
Text in Italian. Attached summary in English.

Descriptors: (*Water, Purification), (*Labeled substances, *Fluid flow), Chemical engineering, Italy.
Identifiers: *Water treatment.

The technique of using tracers for the direct determination of detention periods and of flow velocities in solids-contact units for water treatment was determined. The method was suitable to evidence the occurrence and the degree of short-circuiting which cause some of the inflow to reach the outlet in less than the theoretical detention period. Some applications using chemical and radioactive tracers are described and the relative results are discussed. The method is rather simple and not expensive. (Author)
PB-188 131 HC$3.00 MF$0.65

REGENERATION OF ACID WASTES FROM WATER DESALTING EQUIPMENT BY AN ELECTROCHEMICAL METHOD (K Voprosu o Regeneratsii Kislotnykh Stokov Vodoobessolivayushchikh Ustanovok Elektrokhimicheskim Metodom),
Argonne National Lab., Ill.
For primary bibliographic entry see Field 7A.
PB-188 132T HC$3.00 MF$0.65

A CLASSIFICATION OF METHODS FOR MEASURING FLATNESS (Eine Klassifizierung der Ebenheits-Messemethoden),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 14B.
PB-188 140T HC$3.00 MF$0.65

THE ACCURACY AND RELIABILITY OF ROUGHNESS MEASUREMENTS (Die Genauigkeit und Zuverlaessigkeit der Rauheitsmessung),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 14B.
PB-188 141T HC$3.00 MF$0.65

STUDY OF SPRAYING BORIDES AND NITRIDES BY PLASMA GUN. PART II. CHARACTERISTICS OF THE SPECIMENS OBTAINED (Etude de la Projection des Borures et Nitrures au Chalumeau a Plasma),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 11B.
PB-188 142T HC$3.00 MF$0.65

PROTECTION OF PRESTRESSING STEELS. TOPIC II. NOTES ON SOME PROBLEMS OF PRESTRESSED CONCRETE.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 11D.
PB-188 151T HC$3.00 MF$0.65

A RELIABLE AND REPRODUCIBLE TECHNIQUE FOR MACROSCOPIC ETCHING OF TYPES 304 STAINLESS STEELS,
Dow Chemical Co., Golden, Colo. Rocky Flats Div.
James F. Capes, James W. Snyder, and Arthur E.Calabra. 29 Aug 69, 3p
Contract AT (29-1)-1106

Descriptors: (*Stainless steel, *Etching), Forging, Grinding.
Identifiers: Steel 304.

For abstract, see NSA 23 23.
RFP-1380 HC$3.00 MF$0.65

STUDIES OF THE MEASUREMENT OF SULFUR DIOXIDE IN STACK GASES. THREE CONCURRENT STUDIES.
Industrial Nucleonics Corp., Columbus, Ohio.
For primary bibliographic entry see Field 13B.
For abstract, see NSA 23 23.
TID-25137 HC$3.00 MF$0.65

13I. Machinery and Tools

ON THE CALCULATION OF FORCES AND DISPLACEMENTS IN FRICTION BEARINGS OF CRANKSHAFTS WITH VARIABLE STATIC SUPPORTS.
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Maschinenwesen Und Elektrotechnik.
For primary bibliographic entry see Field 21G.
For abstract, see STAR 07 24.
N69-40840 HC$3.00 MF$0.65

THE DESIGN AND EVALUATION OF A LABORATORY COLD ROLLING MILL.
Master's thesis,
Oak Ridge National Lab., Tenn.
James R. Gibson. Oct 69, 73p
Contract W-7405-eng-26

Descriptors: (*Rolling mills, *Laboratory equipment), Foils, Theses.

For abstract, see NSA 23 23.
ORNL-TM-2625 HC$3.00 MF$0.65

13J. Marine Engineering

ANALYTICAL SIMULATION OF THE THREE-DIMENSIONAL FLOW-FIELD ABOUT A SHIP.
Final rept.,
Michigan State Univ East Lansing Div of Engineering Research
M. Z. v. Krzywoblocki, G. Salyer, and Y. K. Choo.
30 Sep 69, 296p
Contract N00178-68-C-0192
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Destroyers, *Three-dimensional flow), (*Rocket trajectories, Wind), Launching, Rockets, Mathematical models, Velocity, Flow fields.

In previous progress reports various techniques were proposed for calculating the velocity potential and the velocity components in the simulation of the air flow field about a ship. The present report presents a solution by using the technique of discrete, distributed doublets. The technique leads to solutions of small matrices (of approximately the 140th order) and to the calculation of a small number of coefficients. The choice of the small order matrices was intentional. Because the problem can be solved only by means of computer-aided hydrodynamics (numerical approach) and is very complicated due to the shape of the three-dimensional body, a considerable number of pilot programs had to be prepared initially in order to find the appropriate technique for the final calculations of the main flow. A small number of wind-tunnel tests were available for comparison of the numerically calculated values with those obtained from tests. The results of the comparison are good. (Author)
AD-697 989 HC$3.00 MF$0.65

CATHODIC REDUCTION OF CUPROUS OXIDE IN VINYL ANTIFOULING PAINTS,
Defence Research Establishment Pacific Victoria (British Columbia)
For primary bibliographic entry see Field 13H.
AD-698 013

THE FLUCTUATING PRESSURE FIELD OF A DUCTED IMPELLER,
Calgary Univ (Alberta)
D. H. Norrie, and M. R. Hale. 1969, 16p DRB-Reprint-2995
Contract Nonr-4738 (00)
Availability: Pub. in Symposium on Pumping Machinery for Marine Propulsion, New York, N. Y. p42-56 1969.

Descriptors: (*Cargo ships, Vibration), (*Propellers (Marine), Pressure), Ducted bodies, Impellers, Hydrodynamics, Detection, Canada.

The importance of the fluctuating pressure field is outlined and its relationship to underwater detection and vessel vibration is discussed. The theoretical analysis of the fluctuating field is considered. Experimental data are presented for the duct-surface pressure fluctuations in a model ducted-impeller unit designed as a screw propeller replacement for a 19,000 ton dead-weight ore carrier. These pressures were measured over a range of impeller loadings and under uniform and nonuniform inflow conditions, and were analyzed both spectrally and harmonically. Significant conclusions are that the fluctuating pressure decreases rapidly with distance from the impeller, that only blade frequency harmonics are present in the pressure, and that blade thickness controls the pressure field forward of the impeller. (Author)
AD-698 061

CALCULATION OF THE PERFORMANCES OF A SUPERCAVITATING PROPELLER (SIGMA EQUALS 0.4) FOR DIFFERENT ADVANCE COEFFICIENTS (J) - CONFRONTATION, THEORY, EXPERIMENT FINAL SCIENTIFIC REPORT.
Compagnie de Recherches Et D Etudes Aeronautiques, Paris (France).
T. S. Luu, and P. Sulmont. 15 Jul 69, 26p AD-691821
Contract F61052-68-C-0074

Descriptors: *Hydrodynamics, *Performance tests, *Propeller blades, *Supercavitating flow, Distribution (property), Lift, Velocity.

For abstract, see STAR 07 24.
N69-40425 HC$3.00 MF$0.65

CORROSION BY POLLUTED SEA WATER AND ITS PREVENTION (EFFECT ON COPPER ALLOYS),
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 11F.
PB-187 968T HC$3.00 MF$0.65

13L. Safety Engineering

EFFECT OF A STATIC DISSIPATOR ADDITIVE ON THE CHARGING TENDENCY OF JET FUELS,
Naval Research Lab Washington D C
For primary bibliographic entry see Field 21D.
AD-698 119 HC$3.00 MF$0.65

OPERATION FLAMBEAU - CIVIL DEFENSE EXPERIMENT AND SUPPORT: EYEWITNESS ACCOUNTS OF A MASS FIRE.
Final rept.,
Naval Radiological Defense Lab San Francisco Calif
Clay Preston Butler. May 69, 71p

Descriptors: (*Nuclear warfare, Fires), (*Civil defense systems, Fire safety), Thermal radiation, Flames, Clouds, Smokes, Damage assessment, Ignition, Wind, Area coverage.
Identifiers: Flambeau operation, Mass fires, Firebrands, Fire spread.

Seven men skilled in fire research were stationed around the periphery of Flambeau Fire 760-12 and recorded visual impressions of its magnitude. Also, instrumental data were taken both inside the fire zone and outside, so that visual magnitudes of the mass fire may be compared with its measured physical parameters. Visual magnitudes for this fire were: Flame heights up to 300 feet, horizontal flames 100 feet; thermal radiation uncomfortable at 75 feet; able bodied men might escape from center of fire; cap cloud at 3000 feet; streets filled with smoke; fire whirls lifted bushes 100 feet; downwind side of fire showed much more severe activity than the upwind; and firebrands were carried more than 200 feet out of the fire on the downwind side. (Author)
AD-698 135 HC$3.00 MF$0.65

QUENCHING AND EXTINGUISHMENT OF BURNING SOLIDS IN OXYGEN-ENRICHED ATMOSPHERES FINAL REPORT.
Atlantic Research Corp., Alexandria, Va.
R. L. Durfee, and J. M. Spurlock. 22 Sep 69, 53p NASA-CR-101970
Contract NAS9-8470

Descriptors: *Extinguishing, *Fire extinguishers, *Rare gases, *Spacecraft cabin atmospheres, Flammable gases, Plastics, Polymeric films, Thin films.

For abstract, see STAR 07 24.
N69-40390 HC$3.00 MF$0.65

SOME PROBLEMS OF USING HIGH-TEMPERATURE ORGANIC COOLANTS.
Naval Scientific and Technical Information Centre, London (England).
For primary bibliographic entry see Field 11G.
For abstract, see STAR 07 24.
N69-40610 HC$3.00 MF$0.65

STUDY OF FLAME INHIBITION AND VAPOR RELEASE BY MICROENCAPSULATED FIRE RETARDANT COMPOUNDS.
Atlantic Research Corp., Alexandria, Va.
B. K. Copeland, G. V. Elbe, C. Huggett, and E. T. Mc Hale. Sep 69, 71p NASA-CR-73380
Contract NAS2-4988

Descriptors: *Encapsulating, *Flames, *Inhibition, *Stabilizers (agents), *Vapors, Chemical properties, Construction materials, Internal pressure, Particle size distribution, Scattering.

For abstract, see STAR 07 24.
N69-40945 HC$3.00 MF$0.65

OVERVIEW OF INTERNATIONAL HIGHWAY SAFETY PROBLEMS.
Technical rept.
Leasco Systems and Research Corp., Bethesda, Management Systems Group.
30 Jun 69, 320p MSG-104/69 HS-800 184
Contract FH-11-6920

Descriptors: (*Passenger vehicles, Motor vehicle accidents), (*Safety, International law), (*International law, Standardization), Roads, Motor vehicle operators, Advanced planning, Statistical analysis, Wounds+ injuries, Casualties, Mortality rates, Attitudes, Public opinion, Western Europe, Japan, United States, Canada.

The purpose of this study was to assist the National Highway Safety Bureau in filling information gaps in the international highway safety program. The contractor was also required to analyze the technical progress in major foreign countries in meeting their highway safety problems and to suggest means for improving the flow of information between countries. (Author)
PB-187 861 HC$3.00 MF$0.65

RELATIONSHIP OF THE TIRE-PAVEMENT INTERFACE TO TRAFFIC ACCIDENTS OCCURRING UNDER WET CONDITIONS.
Research rept.,

Texas Highway Dept.
Elmore H. Dean. Jun 69, 140p RR-133-1
Prepared in cooperation with the Bureau of Public Roads, Washington, d.c.

Descriptors: (*Motor vehicle accidents, *Atmospheric precipitation), (*Tires, *Skidding), (*Pavements, Safety), Skin friction, Friction, Pressure, Interfaces, Theses.
Identifiers: Tire tread groove depth.

The wet weather (total) accident rate was nearly double the rate for all weather conditions for the five months studied with the pavement being wet 6.7% of the time period. In certain areas the wet weather accident rate for all accidents could vary as much as six times the average wet weather rate for the ten county area. Even though other tire factors are important, the lack of tread depth on the rear tires was of major importance in the accidents studied and particularly for the skidding accidents. Differences were found between the wet pavement skid resistance of the accident sites and the average values within a range of one-half mile from the corresponding sites; however, the differences were small and believed to have little effect on wet weather accidents. A difference was also found between a sample average (39) of the state-wide wet pavement skid resistance and the average (35) of the values at the accident site. (Author)
PB-188 020 HC$3.00 MF$0.65

ANALYSIS AND MODELING OF RELATIONSHIPS BETWEEN ACCIDENTS AND THE GEOMETRIC AND TRAFFIC CHARACTERISTICS OF THE INTERSTATE SYSTEM,
Westat Research, Inc., Bethesda, Md.
J. A. Cirillo, S. K. Dietz, and R. L. Beatty. 1 May 68, 102p
Sponsored by the Bureau of Public Roads, Washington, D.C. Paper copy available from Superintendent of Documents, GPO, Washington, D.C., $1.00.

Descriptors: (*Motor vehicle accidents, Statistical analysis), (*Roads, Traffic), Classification, Configuration, Frequency, Diurnal variations, Mathematical models, Velocity, Performance (Human), Crash injuries, Mortality rates, Urban areas, Rural areas.
Identifiers: *Interstate highways, Interchanges.

Mathematical models are developed to relate the accidents on interstate systems to the geometric and traffic characteristics of the systems. Models were developed for highway elements such as ramps, speed change lanes, etc., and for interchanges such as diamond, trumpet, etc. Results of this analysis are related to traffic.
PB-188 021 MF$0.65

GREENVILLE COUNTY PUBLIC SAFETY STUDY PART II: FIRE PROTECTION.
Greenville County Planning Commission, S.C.

Nov 69, 32p

Descriptors: (*Fire safety, *South Carolina), (*Urban planning, Fire safety), Mission profiles, Analysis, Standards.
Identifiers: Area planning and development, *Greenville County (South Carolina).

The scope of this investigation is to record the level of fire protection in Greenville County and the determination of appropriate action to be taken. Fire protection in the County is provided by twenty-three municipal and public service district firefighting agencies. The report includes an inventory and analysis of these agencies along with the development of realistic fire protection standards to meet present and future needs. (Author)
PB-188 026 HC$3.00 MF$0.65

COMPLIANCE TEST REPORT. TIRES UNIROYAL, SIZE 6.45-14, 8.25-14, 8.55-15, 8.25-14 Super Safety, Standard 109.
ETL, Inc., New York. Automotive Testing Div.
For primary bibliographic entry see Field 13F.
PB-188 055 HC$3.00 MF$0.65

STEERING DIAGNOSIS: A STUDY OF DEGRADED COMPONENTS AFFECTING IN-USE VEHICLE HANDLING.
Clayton Mfg. Co., El Monte, Calif. Dynamometer Div.
For primary bibliographic entry see Field 13F.
PB-188 057 HC$3.00 MF$0.65

STEERING DIAGNOSIS: A STUDY OF DEGRADED COMPONENTS AFFECTING IN-USE VEHICLE HANDLING. APPENDIX.
Clayton Mfg. Co., El Monte, Calif. Dynamometer Div.
For primary bibliographic entry see Field 13F.
PB-188 058 HC$3.00 MF$0.65

DEFOG AND DEFROST SYSTEMS, VOLUME I.
Northern Research and Engineering Corp., Cambridge, Mass.
For primary bibliographic entry see Field 13F.
PB-188 059 HC$3.00 MF$0.65

DEFOG AND DEFROST SYSTEMS. VOLUME II. EXECUTIVE SUMMARY.
Northern Research and Engineering Corp., Cambridge, Mass.
For primary bibliographic entry see Field 13F.
PB-188 060 HC$3.00 MF$0.65

COMPLIANCE TEST REPORT--TIRES. GENERAL JET AIR II 7.00-13. STANDARD 109.
Automotive Research Associates, San Antonio, Tex.
For primary bibliographic entry see Field 13F.
PB-188 121 HC$3.00 MF$0.65

COMPLIANCE TEST REPORT--TIRES. GOODYEAR CUSTOM POWER CUSHION 650-13. STANDARD 109.
Automotive Research Associates, San Antonio, Tex.
For primary bibliographic entry see Field 13F.
PB-188 122 HC$3.00 MF$0.65

COMPLIANCE TEST REPORT--TIRES. MANSFIELD SAFE SERVICE 8.45-15. STANDARD 109.
Automotive Research Associates, San Antonio, Tex.
For primary bibliographic entry see Field 13F.
PB-188 123 HC$3.00 MF$0.65

DOOR LATCH AND DOOR HINGE COMPLIANCE TESTS ON 1968 PONTIAC GRAND PRIX DOOR LATCHES AND DOOR HINGES, MANUFACTURED BY PONTIAC MOTOR DIVISION IN ACCORDANCE WITH 206,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 124 HC$3.00 MF$0.65

DOOR LATCH AND DOOR HINGE COMPLIANCE TESTS ON 1968 DODGE POLARA DOOR LATCHES AND DOOR HINGES, MANUFACTURED BY CHRYSLER CORPORATION IN ACCORDANCE WITH MVSS 206,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 125 HC$3.00 MF$0.65

DOOR LATCH AND DOOR HINGE COMPLIANCE TESTS ON 1968 MERCURY COLONY PARK DOOR LATCHES AND DOOR HINGES, MANUFACTURED BY FORD MOTOR COMPANY IN ACCORDANCE WITH MVSS 206,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 126 HC$3.00 MF$0.65

DOOR LATCH AND DOOR HINGE COMPLIANCE TESTS ON 1968 CADILLAC COUPE DEVILLE DOOR LATCHES AND DOOR HINGES, MANUFACTURED BY CADILLAC MOTOR CAR DIVISION IN ACCORDANCE WITH MVSS 206,
Brown (Dayton T.), Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 127 HC$3.00 MF$0.65

BRAKE, TIRE AND RIM COMPLIANCE TEST ON ONE (1) 1968 AMERICAN AMX397 IN ACCORDANCE WITH MVSS 105 AND MVSS 110,
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 128 HC$3.00 MF$0.65

A STUDY OF THE RELATIONSHIP BETWEEN DRIVER DECISION TIME AND DRIVING ACCIDENT AND VIOLATION RECORD.
Stevens Inst. of Tech., Hoboken, N.J. Davidson Lab.
For primary bibliographic entry see Field 5J.
PB-188 159 HC$3.00 MF$0.65

VEHICLE TEST REPORT FMVSS 204: 1969 VOLKSWAGEN MODEL 11, STEERING CONTROL REARWARD DISPLACEMENT.
Digitek Corp., Marina del Rey, Calif.
For primary bibliographic entry see Field 13F.
PB-188 162 HC$3.00 MF$0.65

SEAT ANCHORAGE TEST ON ONE (1) 1969 CHEVROLET BEL AIR, NHSB NO. 69101 IN ACCORDANCE WITH FMVSS 207.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 163 HC$3.00 MF$0.65

SEAT ANCHORAGE TEST ON ONE (1) 1969 MERCURY COUGAR, NHSB NO. 69201 IN ACCORDANCE WITH FMVSS 207.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 164 HC$3.00 MF$0.65

SEAT ANCHORAGE TEST ON ONE (1) 1969 VOLKSWAGEN SEDAN, NHSB NO. 69501 IN ACCORDANCE WITH FMVSS 207.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 165 HC$3.00 MF$0.65

VEHICLE TEST REPORT FMVSS 204: 1969 FIAT MODEL 850, STEERING CONTROL REARWARD DISPLACEMENT.
Digitek Corp., Marina del Rey, Calif.
For primary bibliographic entry see Field 13F.
PB-188 166 HC$3.00 MF$0.65

STEERING CONTROL REARWARD DISPLACEMENT. PERFORMANCE OF FMVSS 204 SAFETY STANDARD TESTS ON A 1969 CHRYSLER 300. NHSB 69302.
Dynamic Science, Phoenix, Airz. AvSER Facility.
For primary bibliographic entry see Field 13F.
PB-188 167 HC$3.00 MF$0.65

FUEL TANKS, FUEL TANK FILLER PIPES, AND FUEL TANK CONNECTIONS. PERFORMANCE OF FMVSS 301 SAFETY STANDARD TESTS ON 1969 CHRYSLER 300. NHSB 69302.
Dynamic Science, Phoenix, Ariz. AvSer Facility.
For primary bibliographic entry see Field 13F.
PB-188 168 HC$3.00 MF$0.65

FUEL TANKS, FUEL TANK FILLER PIPES, AND FUEL TANK CONNECTIONS. PERFORMANCE OF FMVSS 301 SAFETY STANDARD TESTS ON A 1969 DODGE DART. NHSB 69301.
Dynamic Science, Phoenix, Ariz. AvSER Facility.
For primary bibliographic entry see Field 13F.
PB-188 169 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) PHILLIPS 66, TEST NOS. D9S2041, D9S2042, IN ACCORDANCE WITH FMVSS 109.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 170 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) GENERAL JET. TEST NOS. D9S2001, D9S2006, D9S2003A, D9S2005, AND D9S2008 IN ACCORDANCE WITH FMVSS 109.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 171 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) 1969 MOHAWK STORM TRACK, TEST NO. D9S2011 IN ACCORDANCE WITH FMVSS 109.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 172 HC$3.00 MF$0.65

FUEL TANKS, FUEL FILLER PIPE, AND FUEL TANK CONNECTIONS. PERFORMANCE OF FMVSS 301 SAFETY STANDARD TESTS ON A 1969 RAMBLER NHSB 69401.
Dynamic Science, Phoenix, Ariz. AvSER Facility.
For primary bibliographic entry see Field 13F.
PB-188 173 HC$3.00 MF$0.65

WINDSHIELD DEFROSTING AND DEFOGGING TEST ON ONE (1) 1969 BUICK, NHSB NO. 69102 IN ACCORDANCE WITH FMVSS 103.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 174 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) BRIDGE STONE, TEST NO. D9S2051 IN ACCORDANCE WITH FMVSS 109.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 175 HC$3.00 MF$0.65

PASSENGER CAR PHEUMATIC TIRE TEST ON THREE (3) CO-OP CUSTOM SAFETY, TEST NO. D9S2031 IN ACCORDANCE WITH FMVSS 109.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 176 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) UNIROYAL, TEST NOS. D9S2034, D9S2023, D9S2038, D9S2039, D9S2024, D9S2021, D9S2027 IN ACCORDANCE WITH FMVSS 109.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 177 HC$3.00 MF$0.65

PASSENGER CAR PNEUMATIC TIRE TEST ON THREE (3) SEARS ALLSTATE, MANUFACTURED BY ARMSTRONG TIRE AND RUBBER COMPANY. TEST NOS. D9S2017, D9S2015, D9S2014, D9S2016, D9S2019, D9S2018 IN ACCORDANCE WITH FMVSS 109.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-188 178 HC$3.00 MF$0.65

VEHICLE TEST REPORT FMVSS 301: 1969 VOLKSWAGEN MODEL 11, FUEL TANKS, FUEL FILLER PIPES, AND FUEL TANK CONNECTIONS.
Digitek Corp., Marina del Rey, Calif.
For primary bibliographic entry see Field 13F.
PB-188 180 HC$3.00 MF$0.65

VEHICLE TEST REPORT FMVSS 301: 1969 FIAT MODEL 850, FUEL TANKS, FUEL FILLER PIPES, AND FUEL TANK CONNECTIONS.
Digitek Corp., Marina del Rey, Calif.
For primary bibliographic entry see Field 13F.
PB-188 181 HC$3.00 MF$0.65

STEERING CONTROL REARWARD DISPLACEMENT. PERFORMANCE OF FMVSS 204 SAFETY STANDARD TESTS ON A 1969 RAMBLER NHSB 69401.
Dynamic Science, Phoenix, Ariz. AvSER Facility.
For primary bibliographic entry see Field 13F.
PB-188 182 HC$3.00 MF$0.65

STEERING CONTROL REARWARD DISPLACEMENT. PERFORMANCE OF FMVSS 204 SAFETY STANDARD TESTS ON A 1969 DODGE DART NHSB 69301.
Dynamic Science, Phoenix, Ariz. AvSER Facility.
For primary bibliographic entry see Field 13F.
PB-188 183 HC$3.00 MF$0.65

13M. Structural Engineering

THE STRENGTH AND CREEP OF FROZEN SOILS AND CALCULATIONS FOR ICE-SOIL RETAINING STRUCTURES,
Cold Regions Research and Engineering Lab., Hanover, N.H.
For primary bibliographic entry see Field 8M.
AD-484 093 HC$3.00 MF$0.65

BUILDING SCIENCE ABSTRACTS. NAME AND SUBJECT INDEXES. VOLUME XXXIX, 1966.
Building Research Station Watford (England)

1969, 74P
Availability: Pub. in Building Science Abstracts, v39 p385-452 1966. No copies furnished.

Descriptors: (*Construction, Great Britain), Abstracts, Indexes, Classification, Reports, Subject indexing, Personnel, Organizations.
Identifiers: Building science abstracts.
AD-697 891

FLEXURE THEORY OF STRUCTURAL FIBERGLASS BEAMS,
Foreign Technology Div Wright-Patterson AFB Ohio
L. I. Kalenderyan. 17 Sep 69, 17p Rept no. FTD-HT-23-236-69
Unedited rough draft trans. of Soprotivlenie Materialov i Teorii Sooruzhenii; Mezhvedomstvennyi Respublikanskii Nauchnyi Sbornik (USSR) n6 p155-164 1968.

Descriptors: (*Glass textiles, Beams (Structural)), (*Beams (Structural), Deformation), Flexural strength, Stresses, Strain (Mechanics), Modulus of elasticity, Tensile properties, Compressive properties, Bending, Shear stresses, Structural properties, Design, USSR.
Identifiers: I beams, Translations.

Investigations of the linear stress-strain relation in fiberglass beams (particularly in cold-cured ones) revealed their special features: a high sensitivity to shear, a difference between the elasticity moduli in tension and compression, and the linearity of the stress-strain diagram up to failure. The theory of static flexure of fiberglass beams is presented with the effects of the shearing strain and different elastic moduli taken into account. The hypothesis of plane cross sections and the assumption on the smallness of pressure between fibers are used in deriving formulas for normal and tangential stresses. The effect of the shear force on the angle of slope of the elastic curve is evaluated, and a differential equation of flexure is derived which reflects the effects of shear and of the 'bimodularity' of the material. The integration of this equation by the method of initial parameters is explained on an example of an I-beam under a transverse force combined with a concentrated moment. Design formulas for flexural stress analysis are obtained.
AD-697 916 HC$3.00 MF$0.65

APPROXIMATE DETERMINATION OF STRESSES IN A RECTANGULAR ORTHOTROPIC PLATE OF FINITE DIMENSIONS DURING SYMMETRICAL COMPRESSION BY AN INTERMITTENT LOAD,
Foreign Technology Div Wright-Patterson AFB Ohio
V. F. Bondin. 8 Sep 69, 15p Rept no. FTD-HT-23-403-69
Edited trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Stroitelstvo i Arkhitektura (USSR) n4 p44-52 1962, by D. Koolbeck.

Descriptors: (*Wood, Structural parts), (*Structural parts, Stresses), Rectangular bodies, Numerical analysis, Panels (Structural), Elasticity, Compressive properties, Deformation, Anisotropy, Loading (Mechanics), Structural properties, USSR.
Identifiers: Plates (Structural members), Pine wood, Stress concentration, Wooden structures, Cyclic loads, Translations.

Use is frequently made of parts with a rectangular shape which are subjected to the symmetric action of an evenly distributed intermittent compressive load or of a load distributed over part of the length of the unit. In many cases these parts are manufactured from orthotropic materials of artificial or natural derivation. In particular, in wooden constructions such parts, operating with local buckling, include various substrates, frameworks, wall plates, supporting parts of certain beams and girders, etc. For determination of stresses in structures of this type by theoretical means it is possible to use the method of the theory of elasticity of an anisotropic body, considering them to be orthotropic plates of a thickness equal to unity. (Author)
AD-697 917 HC$3.00 MF$0.65

FOUNDATION INVESTIGATIONS, NASA MISSISSIPPI TEST FACILITY. REPORT I. STATIC VIBRATORY LOAD TESTING OF FOUNDATION PILES AT TEST STAND S-1C.
Technical rept.,
Army Engineer Waterways Experiment Station Vicksburg Miss
John B. Stevens. Nov 69, 93p Rept no. AEWES-TR-S-69-10-1

Descriptors: (*Foundations (Structures), Supports), (*Supports, Loading (Mechanics)), Vibration, Frequency, Response, Soil mechanics, Structural properties, Damping, Mechanical properties, Mathematical prediction, Strain (Mechanics), Failure (Mechanics).
Identifiers: *Pile foundations, *Steel piles, Concrete piles, Pile driving, Pile caps, Settlement (Structural), Static loads, Displacement, Vibratory loads, Stiffness.

Investigations were conducted to determine the behavior of steel H piles and concrete-filled pipe piles subjected to static and vibratory loads. Field tests incl uded static and vibratory loading of single piles and vibratory testing of a group of four H piles with a common cap. Each single pile and one pile of the four-pile group were instrumented with bonded foil-type gages prior to driving. Static loads of up to 200 tons were applied incrementally, and vibratory loads from 1 to 10 tons were applied over a range of frequencies at various static loadings. Strain, settlement, dynamic displacement, and critical frequencies were determined. Fundamental theory was developed for the dynamic behavior of the soil-pile system, and the theoretical data were compared with the experimental data. This study showed that the dynamic behavior of piles subjected to vibratory loads can be determined from static load tests and dynamic theory. (Author)
AD-698 028 HC$3.00 MF$0.65

DYNAMIC BEHAVIOR OF A CYLINDER WITH A CUTOUT,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
F. Brogan, K. Forsberg, and S. Smith. 25 Oct 68, 9p
Contract N00030-66-C-0186
Revision of report dated 25 May 68.
Availability: Pub. in AIAA Jnl., v7 n5 p903-911 May 69. Paper 68-138.

Descriptors: (*Cylindrical bodies, Structural shells), (*Structural shells, Vibration), Structural properties, Numerical analysis, Resonant frequency, Stresses, Digital computers, Experimental data.
Identifiers: *Cylindrical shells, Dynamic structural analysis, Energy methods, Finite difference theory.

The present study presents results of both analytical and experimental investigations of the dynamic behavior of a cylinder with a rectangular cutout. The potential and kinetic energy of a thin shell are approximated by two-dimensional finite difference methods. An algebraic eigenvalue problem is obtained by application of the principle of minimum total energy. The resulting algebraic equation system, which may have as many as 4200 unknowns, is solved efficiently on a high-speed digital computer. The analytical study shows the influence of the cutout on the natural frequencies of the shell, on the mode shape, and on the internal stress distribution. The cutouts range in size from very small holes to openings having an included angle of 120 degrees. The experimental verification was performed on a machined aluminum cylinder which had integral end rings and had a radius to thickness ratio of 180 and a length to radius ratio of 1.3. Excellent agreement between experiment and theoretical predictions was obtained, with the maximum discrepancies being on the order of 4%. The cutout had very little influence on the natural frequencies that were experimentally observed. (Author)
AD-698 047

THE TIMOSHENKO BEAM WITH A MOVING LOAD,
Stanford Univ Calif Dept of Aeronautics and Astronautics
C. R. Steele. 19 Mar 68, 8p
Revision of report dated 15 May 67.
Availability: Pub. in Jnl. of Applied Mechanics, p481-488 Sep 68. Paper 68-WA/APM-2.

Descriptors: (*Beams (Structural), Aerodynamic loading), Load distribution, Foundations (Structures), Differential equations, Integral transforms, Velocity, Mechanical waves, Deformation, Elasticity.
Identifiers: *Timoshenko beams, Moving loads.

The problem of a semi-infinite Timoshenko beam of an elastic foundation with a step load moving from the supported end at a constant velocity is discussed. Asymptotic solutions are obtained for all ranges of load speed. The solution is shown to approach the 'steady-state' solution, except for three speeds at which the steady state does not exist. Previous investigators have considered only the steady-state solution for the moving concentrated load and have indicated that the three speeds are 'critical.' It is shown, however, that only the lowest speed is truly critical in that the response increases with time. For the load speed equal to either the shear or bar velocity, the transients due to the end condition never attained. However, the response is shown to be bounded in time for a distributed load. Thus the nonexistence of a steady state does not necessarily indicate a critical condition. Asymptotic results have also been obtained for the beam without a foundation. (Author)
AD-698 059

ELECTRICAL ANALOG CALCULATOR FOR SHEAR DISTRIBUTION IN A SINGLE-TIER FACTORY BUILDING FRAMEWORK,
Foreign Technology Div Wright-Patterson AFB Ohio
Chin Ken-Fu, and Shih Chiu-Ying. 11 Aug 69, 32p
Rept no. FTD-HT-23-1289-68
Edited trans. of T'u Mu Kung Ch'eng Hsueh Pao (Mainland China) v7 n4 p2-11 1960.

Descriptors: (*Factories, Structural parts), (*Structural parts, Shear stresses), Analog computers, Joints, Simulation, China.
Identifiers: Translations.

The report applies three major laws in linear circuit network and structural mechanics to establish analog circuit for shear distribution in frames. Computer for special application to analysis of single-story industrial plant frames has been built; it can solve various problems regarding rigid joint and hinged joint frame systems of less than four spans and produce conversion coefficient tables for analysis of hinged frames atop columns. Also discussed are problems in building the computer.
AD-698 113 HC$3.00 MF$0.65

CALCULATION OF GLAZE WIND LOADS UPON HIGH INSTALLATIONS,
Army Foreign Science and Technology Center Washington D C
M. V. Zavarina, and M. M. Borisenko. 10 Nov 69, 16p Rept no. FSTC-HT-23-486-69
Trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n210 p39-46 1967.

Descriptors: (*Towers, *Transmission lines), (*Ice, Loading (Mechanics)), Wind, Design, Aerodynamic loading, Radio towers, Meteorological parameters, Wire, Cordage, Electric cables, Mathematical prediction, USSR.
Identifiers: *Ice formation, Power transmission towers, Frost, Translations.

Atmospheric wind-velocity distribution in the area of the Obinskaya tower is investigated, as well as ice and frost formation on the tower. The purpose of the study is to obtain data for the calculation of ice crust and wind load factors affecting communications and power installations. A formula is derived to permit the calculation of normal ice crust loads on wires, cables and ropes when certain additional meteorological information is known. (Author)
AD-698 172 HC$3.00 MF$0.65

NONLINEAR ANALYSIS FOR AXISYMMETRIC ELASTIC STRESSES IN RING-STIFFENED, SEGMENTED SHELLS OF REVOLUTION.
Final rept. Jun 67-Sep 68,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
David Bushnell. Sep 68, 38p Rept no. LMSC-N-26-68-2
Contract N00014-67-C-0256

Descriptors: (*Elastic shells, Stresses), Stiffened cylinders, Geometric forms, Couplings, Rings, Joints, Pressure vessels, Loading (Mechanics), Deformation, Structural properties, Hatches, Numerical analysis, Nonlinear systems, Programming (Computers), Design.
Identifiers: *Segmented structural shells, Stiffening, Equilibrium methods, Finite difference theory.

The finite-difference method is used for the nonlinear analysis of shells of revolution consisting of elastic shell segments of various geometries and wall constructions joined by elastic rings. The analysis and associated digital computer program were developed in response to the need for a better design tool for practical shell structures. Numerical results are presented for displacement and stress distributions in various pressure vessels. Particular emphasis is given to systems in which nonlinear effects are important and may influence the design. Values calculated with linear theory are compared with those from nonlinear theory. (Author)
AD-698 204 HC$3.00 MF$0.65

WIND EFFECTS ON STRUCTURES.
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
G. K. Korbacher. Apr 69, 28p AD-691699, UTIAS-27

Descriptors: *Aerodynamic loads, *Buildings, *Wind tunnel models, Aeroelasticity, Boundary layers, Turbulence, Wind velocity.

For abstract, see STAR 07 24.
N69-40524 HC$3.00 MF$0.65

LOW INCOME HOUSING DEMONSTRATION: AN EVALUATION OF THREE CASE STUDY DWELLINGS,
California Univ., Berkeley. Dept. of Architecture.
For primary bibliographic entry see Field 5K.
PB-188 014 HC$3.00 MF$0.65

LOW INCOME HOUSING DEMONSTRATION,
California Univ., Berkeley. Dept. of Architecture.
For primary bibliographic entry see Field 5K.
PB-188 018 HC$3.00 MF$0.65

EXPERIMENTAL USE OF URETHANE FOAM INSULATION TO CONTROL BRIDGE DECK ICING.
Final research and development rept.
Illinois State Div. of Highways.
Jun 69, 42p RDR-21

Descriptors: (*Bridges, Pavements), (*Ice, Control), (*Expanded plastics, Thermal insulation), Isocyanate plastics, Roads, Ice prevention, Freezing, Thickness, Effectiveness, Cold weather tests.
Identifiers: *Bridge decks, *Ice control, Bridge approaches, Highway bridges, Frost, Ice formation, Differential icing, Evaluation, Spraying.

The general objective of the project was to determine the usefulness of foam insulation as a means of reducing the formation of frost and ice on bridge decks. The specific aim was to evaluate its effectiveness in producing temperature conditions approximating those of the approach pavements, thereby lessening the problem of differential frosting and icing. An attempt also was made to determine the effect of insulation thickness on the degree of protection offered. (Author)
PB-188 028 HC$3.00 MF$0.65

BIBLIOGRAPHY ON DREDGING,
Texas Engineering Experiment Station, College Station.
For primary bibliographic entry see Field 13B.

PB-188 109 HC$3.00 MF$0.65

CONSTRUCTION OF A ROCK-FILL DAM BY LARGE-SCALE DIRECTIONAL DOWNTHROW BLASTS (Sooruzhenie Kamennonabrosnoi Plotiny s Primeneniem Massovykh Nepraviennykh Vzryvov na Sbros),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 13B.
PB-188 149T HC$3.00 MF$0.65

HYPERBOLOIDS OF REVOLUTION SUPPORTED ON COLUMNS. (1) COLUMN-SUPPORTED HYPERBOLOIDS UNDER GRAVITY LOADING. (2) COLUMN-SUPPORTED HYPERBOLOIDS UNDER WIND LOADING.
Final rept.,
Washington Univ., St. Louis, Mo. Dept. of Civil and Enviromental Engineering.
Phillip L. Gould. Sep 69, 80p RR-12
Grant NSF-GK-1501

Descriptors: (*Towers, Design), (*Structural shells, Loading (Mechanics)), Bodies of Revolution, Supports, Beams (Structural), Bending, Stresses, Structural properties, Aerodynamic loading, Wind, Gravity, Numerical analysis, Boundary value problems, Thickness.
Identifiers: *Hyperboloid shells, *Cooling towers, Equilibrium methods, Stress concentration.

The governing equations of the bending theory of thin shells of revolution are solved for the case of a hyperboloid of revolution supported on a large number of columns. Explicit expressions for the stress resultants due to gravity are presented along with parametric studies to illustrate the influence of the important design variables. Explicit expressions for the stress resultants due to quasistatic design wind loading are also presented along with parametric studies to illustrate the influence of the important design variables. (Author)
PB-188 160 HC$3.00 MF$0.65

STUDY OF COMPRESSIVE STRENGTHS OF PORTLAND CEMENT CONCRETE TEST CYLINDERS.
Final rept.,
Maine State Highway Commission. Materials and Research Div.
Horace A. Pratt. May 69, 35p Technical paper-69-1T
Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Construction, Bridges), (*Concrete, Compressive properties), Cylindrical bodies, Mixtures, Flexural strength, Cements, Roads, Water, Air, Particle size, Weight, Correlation techniques, Data processing systems, Programming (Computers), Maine.
Identifiers: *Portland cements, Aggregates.

Concrete compressive strength data from Maine State Highway Commission Bridge projects covering a two-year period were compiled and computer processed in a study attempting to verify suspected variations in strength, and to relate strength to possible causes of variation. Concrete strengths for 1966 were found to be significantly higher than those for 1965, for the same type of mix. Expected significant correlations were verified in a number of sets of data comparing cylinder strength with such variables as water, slump, air content, and the fineness modulus of the fine aggregate. Basic methods for the computer analysis of such data were developed. (Author)
PB-188 186 HC$3.00 MF$0.65

STABILITY OF COLUMNS SUBJECTED TO A RANDOM AXIAL LOAD.
New Mexico Univ., Albuquerque. Bureau of Engineering Research.
For primary bibliographic entry see Field 8K.
PB-188 192 HC$3.00 MF$0.65

RESPONSE OF BILINEAR HARDENING SYSTEMS TO EARTHQUAKE-LIKE EXCITATION.
New Mexico Univ., Albuquerque. Bureau of Engineering Research.
For primary bibliographic entry see Field 8K.
PB-188 193 HC$3.00 MF$0.65

14. METHODS AND EQUIPMENT

14A. Cost Effectiveness

SYSTEMS ANALYSIS AND COST EFFECTIVENESS. PARTS I-VI.
Adjutant General's Office (Army), Washington, D.C.
For primary bibliographic entry see Field 5A.
AD-450 411 HC$3.00

ADVANCED MATERIEL SYSTEMS PLANNING.
Case Inst of Tech Cleveland Ohio Operations Research Group
For primary bibliographic entry see Field 12B.
AD-697 971 HC$3.00 MF$0.65

14B. Laboratories, Test Facilities, and Test Equipment

ACCELERATED LIFE TESTING OF GUIDANCE COMPONENTS.
Autonetics, Anaheim, Calif.
For primary bibliographic entry see Field 17G.
AD-448 079 HC$3.00

AN INVESTIGATION OF DESCRIBING FUNCTION DEVELOPMENT.
Naval Postgraduate School, Monterey, Calif.
For primary bibliographic entry see Field 9E.
AD-487 843 HC$3.00 MF$0.65

LONGITUDINAL FORCES REQUIRED WITH LOOSE LINER BARREL CONSTRUCTION,
Naval Ordnance Lab White Oak Md
For primary bibliographic entry see Field 19F.
AD-697 930 HC$3.00 MF$0.65

VECTOR THRUST LOAD CELL FEASIBILITY STUDY.
Final rept. Apr 68-Jun 69,
Rocketdyne Canoga Park Calif Research Div
R. W. Postma. Dec 69, 114p Rept no. R-7819-F
AEDC-TR-69-233
Contract F40600-68-C-0004

Descriptors: (*Rocket motors, Test equipment), (*Space propulsion, Thrust vector control systems), (*Test equipment, Feasibility studies), Rocket motors (Liquid propellant), Calibration, Thrust, Vector analysis, Interactions, Shear stresses, Deflection, Loading (Mechanics), Response, Design.

This report describes the results of a research study and analysis of a 6-component force balance for testing rocket engines. The balance is essentially a self-contained, semi-portable structure of strain-gaged force links attached at the forward end of the rocket motor. The physical size of a balance which would cover the thrust range of 1000 lbf to 10,000 lbf is 15 inches diameter, 7-1/2 inches overall height, and 225 lb weight. Three geometrical arrangements of force links were considered and one of these using 3 axial force links and 3 side force links was analyzed in detail. The analysis includes force vector resolution, first order interactions arising from structural redundancy and force link misalignment, and second order interactions resulting from distortion of the balance under load. Calibration methods and theory relating to data reduction are also discussed. The study includes an analysis of propellant couplings which compensate for the effects of links and the attached propellant coupling is intended to simplify installation, alignment, and calibration procedures for 6-component rocket engine testing. (Author)
AD-697 953 HC$3.00 MF$0.65

AEROSPACE-AFML CONFERENCE ON NDT OF PLASTIC/COMPOSITE STRUCTURES, DAYTON, OHIO, MARCH 18-20, 1969.
Air Force Materials Lab Wright-Patterson AFB Ohio
20 Mar 69, 474p*

Descriptors: (*Airframes, Structural parts), (*Reinforced plastics, *Non-destructive testing), (*Composite materials, Non-destructive testing), Symposia, State-of-the-art reviews, Quality control, X-ray photography, Ultrasonic radiation, Optical properties, Thermal properties, Electron microscopy, Schlieren photography, Microwaves, Data processing systems, Laminates, Honeycomb cores, Sandwich construction, Bonding, Defects (Materials), Systems engineering, Blade airfoils, Fuel nozzles.
Identifiers: Fiber composites, Holography, Computer graphics, Evaluation, F-111 aircraft, F-5 aircraft, T-38 aircraft.

The document contains a collection of twenty papers presented by nondestructive testing engineers and scientists at the Aerospace-AFML conference on nondestructive testing of Plastic/Composite Structures held in March, 1969. Topics covered included a state of the art review, acoustic optical imaging, x-ray mapping of flaws by computer graphics, ultrasonics, microwave and thermal techniques. (Author)
AD-697 956 HC$3.00 MF$0.65

THICK FILM THERMOCOUPLE GAUGES FOR ROUGHENED MODEL HEAT FLUX MEASUREMENTS.
Rept. for Feb-May 69,
Aerospace Corp El Segundo Calif Lab Operations
Keith E. Starner, and Robert L. Varwig. 30 Sep 69, 29p Rept no. TR-0066 (5240-10)-1 SAMSO-TR-69-359
Contract F04701-69-C-0066

Descriptors: (*Shock tubes, Instrumentation), (*Heat transfer, *Surface roughness), (*Calorimeters, Design), Model tests, Turbulent boundary layer, Reynolds number, Metal films, Copper, Thickness, Heat flux, Thermocouples, Response, Calibration, Performance (Engineering), Experimental design, Errors.
Identifiers: Thick film calorimeters, Evaluation.

The study of wall roughness effects on model heat transfer in high Reynolds number shock tunnel flows of a few milliseconds duration requires the use of a rugged, fast-response calorimeter of known surface roughness. Models constructed of continuous thin copper sheeting over a solid insulator substrate with rear thermocouples attached were developed for this purpose. The surface of the copper can be roughened as required and thus forms both an unbroken model surface segment and a heat flux calorimeter. Conditions of heat flux and tunnel test time under which the gauge is useful are shown by analysis. Results from calibration experiments and shock tunnel tests are discussed. (Author)
AD-697 962 HC$3.00 MF$0.65

DESIGN STUDY OF A TACTILE CUING SYSTEM FOR PILOT TRAINING.
Final rept. 1 Feb 68-15 Jul 69,
Stanford Research Inst Menlo Park Calif
John W. Hill, Kenneth W. Gardiner, and James C. Bliss. Aug 69, 112p* AFHRL-TR-69-12
Contract F33615-68-C-1435

Descriptors: (*Flight simulators, Experimental design), (*Pilots, Air Force training), Vibrators (Mechanical), Sensory perception, Stimulation, Errors, Learning, Tracking, Flight paths, Training devices.
Identifiers: Tactile cuing systems, Evaluation, Bioelectric control, Manual tracking, Biostimulation.

Several vibrator, air jet, and moving-button tactile stimulator-units were evaluated as cuing aids for pilot training in a manual tracking task. The best units, as determined by minimum mean square error and best operator describing function were built into a flight simulator. These units were further evaluated for their ability to help pilots control the trainer in some flight-simulation tracking tasks such as altitude holding and ILS landing. A one-dimensional tactile cuing system was designed using information obtained from these experiments. The cuing system, which consisted of two vibrators attached to the arms indicating heading error in excess of five degrees, was tested in a controlled experiment with four pilots having less than 200 hours of flight time. A selected review of the literature and current research was carried out to assess the feasibility and appropriateness of biostimulation and bioelectric control for pilot training and aircraft control. (Author)
AD-697 991 HC$3.00 MF$0.65

ULTRASONIC EVALUATION OF TUBE WASTAGE IN MARINE BOILERS,
Defence Research Establishment Pacific Victoria (British Columbia)
For primary bibliographic entry see Field 13A.
AD-698 012

DEVELOPMENT AND EVALUATION OF AN APPARATUS FOR THE DIRECT TENSILE TESTING OF ICE.
Special rept.,
Cold Regions Research and Engineering Lab Hanover N H
Ivor Hawkes. Oct 69, 31p Rept no. CRREL-SR-131

Descriptors: (*Ice, *Test equipment), (*Tensile properties, Ice), Compressive properties, Strain (Mechanics), Design, Calibration, Stresses, Brittleness.

The report discusses the theory of the uniaxial tensile test of a brittle material and describes in detail the development and calibration of an apparatus designed to subject fine-grained polycrystalline ice specimens to uniaxial tensile and compressive loads up to failure, and to give a continuous stress-strain curve during the loading cycle. (Author)
AD-698 022 HC$3.00 MF$0.65

DEVELOPMENT OF A LABORATORY TECHNIQUE FOR DEFINING MECHANICAL SHEAR STABILITIES OF MULTI-GRADE ENGINE OILS.
Army Coating and Chemical Lab Aberdeen Proving Ground Md
For primary bibliographic entry see Field 11H.
AD-698 027 HC$3.00 MF$0.65

A TECHNIQUE FOR PREPARING AND MOUNTING THIN NICKEL FOILS,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
For primary bibliographic entry see Field 11F.
AD-698 058

DEVICE FOR THE SPECTRAL ANALYSIS OF A SUBSONIC PROCESS.
Army Foreign Science and Technology Center Washington D C
V. G. Kaduk, Yu. A. Skripnik, and K. B. Krukovskii-Sinevich. 19 Nov 69, 6p Rept no. FSTC-HT-23-203-70
Trans. of Patent (USSR) 224 698.

Descriptors: (*Audiofrequency, *Spectrum analyzers), Oscillation, Electronic commutators, USSR, Patents.
Identifiers: *Sound analyzers, Translations.

The invention concerns a measuring technique and in particular a filterless analyzer of electrical oscillations with an absolutely constant transmission band. The purposed device for the spectral analysis of a subsonic process is distinguished from known devices by the fact that in it the frequency-converted voltage to be studied and the reference voltage are fed alternately with the low frequency to the input of the orthogonal converter supplied by the reference sinusoidal voltage using commutators. This is achieved by the corresponding switching of the commutator. Measurement is made by compensation method with high accuracy. Returning the frequency of the pulse modulator in the measuring process makes it possible to apply quadrature splitting of the reference voltage or the orthogonal converters and thus avoid the effect of phase shifts of the harmonic components on the measurement accuracy. The advantage of this device is the small measuring time, the simplicity and ease of measurement, and the high measurement accuracy, determined basically by the error in the attenuator and the stability of the voltage level of the heterodyne. (Author)
AD-698 083 HC$3.00 MF$0.65

SOVIET LASER GEODIMETER.
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 8E.
AD-698 115 HC$3.00 MF$0.65

PHOTOFRAGMENT SPECTROSCOPY OF DISSOCIATIVE EXCITED STATES,
California Univ San Diego La Jolla Dept of Chemistry
For primary bibliographic entry see Field 7D.
AD-698 158 HC$3.00 MF$0.65

R-390A/URR DIGITAL FREQUENCY READOUT UNIT.
Interim rept.,
Syracuse Univ Research Corp N Y Defense Systems Div
Imants Bicevskis, and William Emeny. Jul 69, 56p Rept no. DSD-R-253
Contract N00014-66-C-0118

Descriptors: (*Radio receivers, *Frequency meters), High frequency, Digital systems, Tuning devices, Logic circuits, Frequency converters, Relaxation oscillators.
Identifiers: Monostable multivibrators.

The design and development of the R-390A/URR Digital Frequency Readout Unit is presented. The history of development including the techniques considered are discussed. Digital pulse subtraction, which was chosen as the most economical technique, is described in detail. The new approach to frequency readout uses the existing local oscillators of the receiver and, by a pulse subtraction process, extracts the input frequency of the receiver with an accuracy of plus or minus 20 Hz. (Author)
AD-698 190 HC$3.00 MF$0.65

EDDY CURRENT NONDESTRUCTIVE TEST TUBING CROSS-SECTION DISPLAY DEVICE,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
H. L. Libby. Aug 69, 15p
Contract AT (45-1)-1830

Descriptors: (*Non-destructive testing, *Pipes), Display systems, Electric currents.
Identifiers: Eddy current tests.

For abstract, see NSA 23 23.
BNWL-1158 HC$3.00 MF$0.65

GROUP IV AND V TRANSITION METAL RICH CHALCONIDE X-RAY POWDER DIFFRACTION DATA,
Ames Lab., Iowa.
For primary bibliographic entry see Field 20B.
For abstract, see NSA 23 23.
IS-2133 HC$3.00 MF$0.65

STANDARD TIME AND FREQUENCY: ITS GENERATION, CONTROL, AND DISSEMINATION FROM THE NATIONAL BUREAU OF STANDARDS TIME AND FREQUENCY DIVISION.
Technical note,
National Bureau of Standards, Boulder, Colo. Time and Frequency Div.
John B. Milton. Aug 69, 34p
Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.35.

Descriptors: (*Time signals, Standards), (*Frequency, Standards), Time, Atomic clocks, Cesium, Scale, Clocks, Synchronization (Electronics), Signal generators, Radio stations, Radio signals, Calibration, Laboratories, Dissemination, Control, Accuracy, Reliability, United States Government.
Identifiers: *Cesium frequency standards, *Time standards, Primary standards, Secondary standards, National Bureau of Standards.

The Time and Frequency Division of the National Bureau of Standards produces the NBS time scales. These time scales are developed by utilizing the properties of the NBS frequency standard, NBS-III cesium beam. The main byproduct of these time scales is the operational clock systems. These operational clock systems are used, among other things, to calibrate the clocks and secondary standards necessary for the operation of the NBS radio stations, WWV, WWVB, WWVL, and WWVH. These stations transmit NBS time scales, and various tones, alerts, and corrections for time-of-day information. (Author)
NBS-TN-379 HC$0.35 MF$0.65

SOME APPLICATIONS OF THE JOSEPHSON EFFECT.
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
For primary bibliographic entry see Field 20L.
NBS-TN-381 HC$0.65 MF$0.65

METEOROID PENETRATION DETECTOR DEVELOPMENT PROGRAM, VOLUME 1 FINAL SUMMARY REPORT.
Martin Marietta Corp., Denver, Colo.
R. O. Del Gray, R. L. Mc Cord, and S. L. Russak.
Oct 69, 369p NASA-CR-66840
Contract NAS1-7043

Descriptors: *Detectors, *Experimental design, *Meteoritic damage, *Penetration, *Research and development, Fabrication, Joining, Meteorite craters, Pressure chambers, Reliability engineering, Target thickness.

For abstract, see STAR 07 24.
N69-40036 HC$3.00 MF$0.65

DEVELOPMENT OF A SKIN-FRICTION BALANCE TO INVESTIGATE SOURCES OF ERROR IN DIRECT SKIN- FRICTION MEASUREMENTS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
For primary bibliographic entry see Field 20D.
For abstract, see STAR 07 24.
N69-40054 HC$3.00 MF$0.65

FLOW-DIRECTION MEASUREMENT WITH FIXED-POSITION PROBES.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
T. J. Dudzinski, and L. N. Krause. Oct 69, 16p
NASA-TM-X-1904

Contract 720-03

Descriptors: *Flow direction indicators, *Flow measurement, *Flowmeters, *Static pressure, Aerodynamic forces, Fixtures, Pressure gages, Three dimensional flow, Two dimensional flow.

For abstract, see STAR 07 24.
N69-40059 HC$3.00 MF$0.65

THE ORBITAL RESEARCH CENTRIFUGE - CONTINUED DESIGN AND FEASIBILITY STUDY FINAL REPORT.
General Dynamics/Convair, San Diego, Calif.
For primary bibliographic entry see Field 6S.
For abstract, see STAR 07 24.
N69-40074 HC$3.00 MF$0.65

ACCEPTANCE TESTS OF TWO HEWLETT-PACKARD TYPE 3420 B (NOS. 493 AND 500) DIFFERENTIAL VOLTMETERS.
Essais de Recette de Deux Voltmetres Differentiels Hewlett-packard Type 3420 B, No. 493 Et No. 500
Laboratoire de Recherches Balistiques Et Aerodynamiques, Vernon (France).
2 Jun 69, 70p LRBA-E-520-PV-3/SEV/SI
Lang- in French

Descriptors: *Electric equipment tests, *Performance tests, *Voltmeters, Circuit diagrams, Direct current, Drift (instrumentation), Ratiometers, Tables (data), Temperature effects.

For abstract, see STAR 07 24.
N69-40151 HC$3.00 MF$0.65

PERFORMANCE OF THE NIMBUS 2 MEDIUM RESOLUTION RADIOMETER.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 07 24.
N69-40197 HC$3.00 MF$0.65

ACCEPTANCE TEST REPORT OF METREL GV 500 VIBRATION TEST MACHINE.
Compte Rendu de Reception Du Pot Vibrant Metrel Gv 500
Laboratoire de Recherches Balistiques Et Aerodynamiques, Vernon (France).
27 May 69, 85p LRBA-E-110-NT-4/SEV/SI
Lang- in French

Descriptors: *Environmental tests, *Mechanical oscillators, *Vibration simulators, Accelerometers, Circuit diagrams, Harmonic oscillation, Magnetic fields, Performance tests, Transverse oscillation.

For abstract, see STAR 07 24.
N69-40472 HC$3.00 MF$0.65

LABORATORY OF AEROSPACE MEDICINE.
Techtran Corp., Glen Burnie, Md.
For primary bibliographic entry see Field 6K.
For abstract, see STAR 07 24.
N69-40594 HC$3.00 MF$0.65

GREENWICH TIME REPORT, APRIL - JUNE 1968.
Royal Greenwich Observatory, Herstmonceux (England).
R. V. Woolley. 1969, 14p

Descriptors: *Latitude measurement, *Time signals, *Universal time, Periodic variations, Radio signals, Seasons, Tables (data).

For abstract, see STAR 07 24.
N69-40601 HC$3.00 MF$0.65

A CONVERSION TABLE FOR WAVELENGTHS TO ELECTRON VOLTS AND 1/CM INTERIM TECHNICAL REPORT.
Gca Technology Div., Gca Corp., Bedford, Mass.
J. A. Samson. Jan 69, 283p NASA-CR-106406, GCA-TR-69-2-N
Contract NASW-1726

Descriptors: *Conversion tables, *Energy spectra, *Far ultraviolet radiation, *Wavelengths, Spectral energy distribution, Units of measurement.

For abstract, see STAR 07 24.
N69-41037 HC$3.00 MF$0.65

ENERGY DISTRIBUTION OF A SPIRALING ELECTRON BEAM.
National Aeronautics and Space Administration. Electronics Research Center, Cambridge, Mass.
For primary bibliographic entry see Field 9A.
For abstract, see STAR 07 24.
N69-41208 HC$3.00 MF$0.65

TEKTITE 1 - TWO GAS ATMOSPHERE SENSOR SYSTEM DEVELOPMENT FINAL REPORT.
Perkin-elmer Corp., Pomona, Calif. Aerospace Systems.
1969, 75P NASA-CR-66835
Contract NAS1-8631

Descriptors: *Atmospheric pressure, *Environmental control, *Gas analysis, *High pressure, *Mass spectrometers, *Underwater engineering, Gas pressure, Manuals, Revisions.

For abstract, see STAR 07 24.
N69-41212 HC$3.00 MF$0.65

THE DESIGN AND EVALUATION OF A LABORATORY COLD ROLLING MILL.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 13I.
For abstract, see NSA 23 23.
ORNL-TM-2625 HC$3.00 MF$0.65

A VERSATILE MOLECULAR BEAM APPARATUS UTILIZING ELECTRON BOMBARDMENT DETECTION: OBSERVATION OF THE RAINBOW EFFECT FOR ARGON-NITROGEN.
Doctoral thesis,
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
Robert William Bickes, Jr. 15 Sep 69, 248p WIS-TCI-358X

Descriptors: (*Molecular beams, Laboratory equipment), (*Argon, Scattering), Test methods, Design, Electron bombardment, Elastic scattering, Nitrogen, Neon, Theses.
Identifiers: Rainbow scattering.

A versatile molecular beam scattering apparatus has been designed, fabricated and tested. The instrument consists of a large scattering chamber which contains differentially pumped nozzle-skimmer and detector chambers. The development and testing of an electron bombardment detector (modified Weiss type ionizer with Paul-Steinwedel mass filter) is also detailed. The ionization efficiency of the detector (the ratio of mass-selected ions collected to neutral atoms entering the detector) was determined using a calibrated effusive beam. Measurements are reported of the differential elastic scattering of a supersonic nozzle beam of Ar crossed by thermal beams of N2 and Ne in the 90-degree 'out-of-plane' configuration. (Author)
PB-188 011 HC$3.00 MF$0.65

FEASIBILITY STUDY FOR THE DEVELOPMENT OF A MULTIFUNCTIONAL EMISSION DETECTOR FOR NO, CO, AND SO2.
Final rept., 20 Aug 68-19 Aug 69,
Monsanto Research Corp., Dayton, Ohio. Dayton Lab.
Arthur D. Snyder, and George W. Wooten. 19 Oct 69, 63p*
Contract CPA-22-69-8

Descriptors: (*Air pollution, *Gas detectors), (*Carbon monoxide, Gas detectors), (*Chemiluminescence, Gas detectors), Feasibility studies, Nitrogen oxides, Sulfur compounds, Oxygen, Monitors, Design.
Identifiers: *Sulfur dioxide, *Nitrogen oxide (NO), Nitrogen dioxide.

The feasibility of multifunctional detection of NO, CO, and SO2 in ambient air, based on the chemiluminescent reaction of these pollutants with atomic oxygen, was studied in a laboratory prototype detection system. Using this approach, concentrations as low as 5 ppb NO have been detected, and laboratory evidence predicts detection capabilities for SO2 to be below 1 ppb. The CO-O reaction produced insufficient glow for adequate detection below approximately 100 ppm. A linear relationship was established between glow intensity and pollutant concentration in all cases. Nitrogen dioxide interfered with NO detection but no other serious interference problem was observed. Here, the responses of NO2 and NO were identical, and the chemiluminescent reaction with atomic oxygen provides a sensitive means for detecting both NO and NO2 in ppb concentrations. In both the NOx-O and the SO2-O reactions, the present detection limit characteristics of the laboratory apparatus can be significantly enhanced by further optimization of the system. (Author)
PB-188 103 HC$3.00 MF$0.65

FEASIBILITY STUDY FOR THE DEVELOPMENT OF A MULTIFUNCTIONAL EMISSION DETECTOR FOR AIR POLLUTANTS BASED ON HOMOGENEOUS CHEMILUMINESCENT GAS PHASE REACTIONS.
Final rept. 15 Aug 68-14 Sep 69,
AeroChem Research Labs., Inc., Princeton, N.J.
Arthur Fontijn, Alberto J. Sabadell, and Richard J. Ronco. Sep 69, 29p* TP-217
Contract CPA-22-69-11

Descriptors: (*Air pollution, *Gas detectors), (*Chemiluminescence, Gas detectors), (*Ozone, Gas detectors), (*Carbon monoxide, Gas detectors), Feasibility studies, Monitors, Nitrogen oxides, Design.
Identifiers: *Nitrogen oxide (NO).

The reactions of common air pollutants, such as NO, NO2, and CO, with certain second reactants, such as ozone or O atoms, result in light emission. In a detector based on this principle, ambient air and the second reactant can be continuously flown through and mixed in a reactor under moderate vacuum. After calibration a continuous record of pollutant concentration can be obtained. Specific sensitivity to a given pollutant is obtained by a suitable choice of the second reactant and a light filter. To demonstrate the feasibility of the method, the detection of NO using O3 has been studied experimentally. A linear response from about 4 ppb NO to at least 100 ppm NO is obtained. NO2, CO2, CO, C2H4, NH3, SO2, and H2O in concentrations found in polluted air do not interfere with NO monitoring. Based on these results and data for other chemiluminescent reactions, it is shown that homogeneous chemiluminescence monitors for O3, NOx= NO+ NO2 and CO can probably also be developed. A comparison of various methods of photomultiplier tube output measurement has been made. (Author)
PB-188 104 HC$3.00 MF$0.65

A CLASSIFICATION OF METHODS FOR MEASURING FLATNESS (Eine Klassifizierung der Ebenheits-Messemethoden),
California Univ., Berkeley. Lawrence Radiation Lab.
J. Kilpi. Nov 69, 21p UCRL-Trans-10406
Trans. of C.I.R.P. Annalen (West Germany) v17 MS 74 pl-74 Nov 69, by F. D. Jones.

Descriptors: (*Metal plates, Surface roughness), (*Precision finishing, Measurement), Triangulation, Geometry, Tolerances (Mechanics), Errors,

Machine shop practice, Optical instruments, Comparators, Micrometers, West Germany, Quality control.
Identifiers: Translations.

Depending on the nature of the measuring method, the measuring pattern has to satisfy certain minimum requirements in order that the flatness might be determined. Thus three groups are obtained. The methods based on the measurement of straightness required at least three divergent measuring series, which meet in the vertices of a triangle lying in the area to be measured. If the measuring apparatus determines the inclination with regard to a certain datum plane, two intersecting series will be enough. The measurement of the height coordinates does not require any special measuring pattern since each point can be determined independently of the others. The methods of measuring straightness and inclination require mathematical adjustment operations, which influence essentially the reliability of the end result. (Author)
PB-188 140T HC$3.00 MF$0.65

THE ACCURACY AND RELIABILITY OF ROUGHNESS MEASUREMENTS (Die Genauigkeit und Zuverlaessigkeit der Rauheitsmessung),
California Univ., Berkeley. Lawrence Radiation Lab.
H. von Weingraber. Oct 69, 44p UCRL-Trans-10398
Trans. of C.I.R.P. Annalen (West Germany) v17 MS 124 pl-14 Oct 69, by L. B. Kapp.

Descriptors: (*Metal plates, Surface roughness), (*Precision finishing, Measurement), Accuracy, Calibration, Tolerances (Mechanics), Standards, Quality control, Machine shop practice, Optical instruments, Errors, Standardization, West Germany.
Identifiers: Translations.

Various investigations, and finally those of the Subcommittee 'Methods of Surface Measurement' of the OECD-Group of Experts 'Surface Quality Control' have shown that the roughness values indicated by surface roughness measuring instruments of the same type as well as those of different types scattered very much in spite of careful calibration. It is demonstrated that these deviations are based to a great extent on the uncertainty of the calibration operation itself. Further, the deviations caused by the peculiarities of the different types of roughness measuring instruments are considered. The question as to what precision and reliability of the surface roughness measuring instruments must be required is treated. (Author)
PB-188 141T HC$3.00 MF$0.65

DIFFUSION-SURFACE IONIZATION ALKALI METAL ION SOURCE.
Research rept.,
Sandia Labs., Albuquerque, N. Mex.
J. F. Cuderman. May 69, 37p* SC-RR-69-98

Descriptors: (*Ion sources, *Alkali metals), Design, Membranes, Diffusion, Refractory metals.

An ion source is described wherein alkali metal atoms diffuse through a thinmembrane emitter of nonporous refractory metal operating at temperatures in excess of 800 C. The ion source is a double-oven configuration containing potassium metal. The first oven is a low-temperature cell, operating at 300 C or higher, which controls the pressure of the alkali metal vapor in the source. The second oven of the configuration has, as part of its surface, a membrane of refractory metal of thickness 0.050 cm or less. This cell, when heated to 800 C or higher, yields ion currents in the range of 0.001 to 10 to the -7th A/cm2. The neutral flux, in the direction normal to the emitter, is in the range of 10 to the 11th to 10 to the 13th atoms/sr/sec. Both neutral and ion emission are measured as a function of emitter temperature and saturated potassium metal vapor pressure for potassium diffusing through Ta, W, and Mo. (Author)
PB-188 146 HC$3.00 MF$0.65

METHOD AND EQUIPMENT FOR MAKING PREPARATIONS OF MICROSCOPIC PARTICLES OF SOLID SUBSTANCES (Zpusob a Zarizeni k Provedeni Pripravy Preparatu Mikroskopickych Castic Pevnych Latek),
California Univ., Berkeley. Lawrence Radiation Lab.
J. Blazek, and B. Starkova. Oct 69, 11p UCRL-Trans-10396
Trans. of Patnet (Czechoslovakia) 118 566, 15 May 66, by S. Berger.

Descriptors: (*Electron microscopy, Particles), (*Particles, Centrifuge separation), (*Laboratory equipment, Patents), Preparation, Design, Experimental design, Membranes, Colloids, Czechoslovakia.

This patent describes a method of making preparations of microscopic particles of solid substances, particularly for observation in an electron miscroscope, by centrifuging a sample of particles onto a thin membrane, and the equipment used in the procedure. (Author)
PB-188 150T HC$3.00 MF$0.65

CRYOGENIC FLOW RESEARCH FACILITY OF THE NATIONAL BUREAU OF STANDARDS,
National Bureau of Standards, Boulder, Colo. Inst. for Basic Standards.
J. W. Dean, J. A. Brennan, and D. B. Mann. 1969, 7p R-533
Pub. in Advances in Cryogenic Engineering, v14 p299-305. Proceedings of the Cryogenic Engineering Conference, Case Western Reserve University, Cleveland, Ohio, 19-21 Aug 68.

Descriptors: (*Cryogenics, *Test facilities), Flowmeters, Measurement, Mass transfer, Liquefied gases.

Objectives of the program, which includes an experimental facility, are to study cryogenic fluid measuring practices, to develop recommended practices for the most effective transfer of cryogenic fluids of interest in commerce, and to allow testing of new concepts in measurement. The experimental cryogenic facility will allow study of fluid metering and fluid metering practices under controlled conditions over a wide range of temperatures and pressures. It is believed that from these studies a uniform methodology for flow measurement of cryogenic fluids can be defined, and new flow measurement techniques evaluated. Problems associated with cryogenic flow metering have tended to solidify into two general areas. These are the rate-type high flow rate conditions found in aerospace work, and the quantity type moderate flow rate metering associated with the commercial transfer. The program is currently oriented towards satisfying the commercial transfer needs. Thus, the selection of liquids, pressures, temperatures, and flow rates were determined by consultation with interested government agencies, industrial groups, and regulatory agencies. (Author)
PB-188 215

INTERPRETATION OF GGL CEMENTOGRAMS FOR WELLS IN THE WESTERN PREDKAVKAZE, (Interpretatsiya Tsementogramm GGK po Skvazhinam Zapadnogo Predkavkazya),
California Univ., Berkeley. Lawrence Radiation Lab.
V. K. Popov, L. I. Nazarenko, and S. P. Omes. Jun 69, 22p
Trans. of Razvedochnaya Geofizika (USSR) n23 p94-105 1967, by T. Watt.

Descriptors: (*Petroleum industry, Well logging), (*Cements, Control), (*Underground structures, Cements), Drilling, USSR, Densitometers.
Identifiers: *Well casings, *Gamma ray logs, Translations, *Resistivity logs.

For abstract, see NSA 23 23.
UCRL-Trans-10362 HC$3.00 MF$0.65

DEVELOPMENT OF A BORON CONCENTRATION METER.
Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Dept.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
WCAP-3690-5 HC$3.00 MF$0.65

DEVELOPMENT OF A BORON CONCENTRATION METER.
Final rept.,
Westinghouse Electric Corp., Pittsburgh, Pa. Nuclear Energy Systems Div.
J. E. Bulkowski, W. D. Fletcher, A. G. Opitz, V. Rajagopal, and D. D. Whyte. Apr 69, 188p
EURAEC-2094
Contract AT (30-1)-3690

Descriptors: (*Reactor coolants, *Boron), Concentration (Chemistry), Meters.

For abstract, see NSA 23 23.
WCAP-3690-7 HC$3.00 MF$0.65

14C. Recording Devices

CALIBRATION OF NBS SECONDARY STANDARD MAGNETIC TAPE (COMPUTER AMPLITUDE REFERENCE) USING THE REFERENCE TAPE AMPLITUDE MEASUREMENT 'PROCESS A',
National Bureau of Standards, Washington, D.C. Center for Computer Sciences and Technology.
For primary bibliographic entry see Field 9B.
NBS-SP-260-18 HC$0.50 MF$0.65

14D. Reliability

PHASE I. NEW PROTECTIVE SYSTEM DESIGN TECHNIQUES FOR APPLICATION IN NUCLEAR REACTOR PLANTS. VOLUME II,
Pennsylvania State Univ., University Park. Dept. of Nuclear Engineering.
M. A. Schultz, and G. C. Geisler. 31 Mar 69, 430p
Contract AT (30-1)-3986

Descriptors: (*Reactor safety systems, Reliability), (*Reliability, Bibliographies), Redundant components, Abstracts.

For abstract, see NSA 23 23.
NYO-3986-1-Vol. 2 HC$3.00 MF$0.65

14E. Reprography

A MULTI-SENSOR STUDY OF PLANT COMMUNITIES AT HORSEFLY MOUNTAIN, OREGON,
Kansas Univ Lawrence Center for Research in Engineering Science
For primary bibliographic entry see Field 6F.
AD-698 098

USE OF AERIAL METHODS IN LANDSCAPE STUDIES,
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 8B.
AD-698 170 HC$3.00 MF$0.65

A TECHNIQUE FOR PRODUCING COLOR PICTURES FROM BLACK-AND-WHITE NEGATIVES,
Rand Corp Santa Monica Calif
Jeanine V. Lamar. Nov 69, 9p Rept no. P-4254
Presented at the UAIDE Annual Meeting (8th), Coronado, Calif., 3-6 Nov 69.

Descriptors: (*Color photography, Simulation), Photographic film, Programming (Computers), Photographic tone.
Identifiers: *Color separation.

The method of transforming an original image in tones of gray into a chromatic reproduction is discussed. A computer, the SD4060, was coded to produce a series of plots, on 35 mm film, varying the number of spots and their sizes per unit area. The film was read on a densitometer to establish the correlation between the transmittance and the plot patterns. A 21-step gray scale was designed and a Fortran program, using calls to the IGS Subroutines, was written to produce two separation negatives. These were subsequently printed in register successively through red and blue filters on a negative color material. (Author)
AD-698 186 HC$3.00 MF$0.65

PATENT APPLIED FOR STEREOSCOPIC PERSPECTOGRAPH,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 8B.
JPRS-49348 HC$3.00 MF$0.65

APOLLO 9 MULTISPECTRAL PHOTOGRAPHY - GEOLOGIC ANALYSIS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
P. D. Lowman, Jr.. Sep 69, 57p NASA-TM-X-63714
Contract X-644-69-423

Descriptors: *Apollo 9 flight, *Earth planetary structure, *Geology, *Photointerpretation, *Satellite-borne photography, *Terrain analysis, Aerial photography, Color photography, Earth surface, Geological faults, Manned space flight, Structural analysis.

For abstract, see STAR 07 24.
N69-40203 HC$3.00 MF$0.65

APOLLO 8 COLORIMETRY.
Bellcomm, Inc., Washington, D. C.
For primary bibliographic entry see Field 20F.
For abstract, see STAR 07 24.
N69-40799 HC$3.00 MF$0.65

THE EFFECT OF OBJECT MOTION IN FRAUNHOFER HOLOGRAPHY WITH APPLICATION TO VELOCITY MEASUREMENTS.
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
W. P. Dotson, Jr.. Nov 69, 23p NASA-TN-D-5515
Contract 039-00-00-00-72

Descriptors: *Acceleration (physics), *Fraunhofer lines, *Holography, *Velocity measurement, Analysis (mathematics), Functions (mathematics), Integral equations, Predictions.

For abstract, see STAR 07 24.
N69-40812 HC$3.00 MF$0.65

LAND USE AND NATURAL RESOURCE INVENTORY OF NEW YORK STATE,
New York State Office of Planning Coordination, Albany.
For primary bibliographic entry see Field 5A.
PB-187 986 HC$3.00 MF$0.65

15. MILITARY SCIENCES

15A. Antisubmarine Warfare

AN APPLICATION OF SEMI-MARKOV CHAINS TO ASW TACTICAL SYSTEMS,
Center for Naval Analyses Arlington Va Operations Evaluation Group
D. D. Culbertson. 26 Sep 69, 17p Rept no. OEG-Research Contrib-118
Contract N00014-68-A-0091

Descriptors: (*Antisubmarine warfare, Probability), Stochastic processes, Tactical warfare.
Identifiers: Markov chains.

An application of semi-Markov chains to Anti Submarine Warfare (ASW) tactical systems is illustrated with a hypothetical example. The example involves estimating the probabilities of prosecuting false contacts for varying lengths of time. The use of Markov chains in the analysis of ASW systems, using Fleet ASW Data Analysis Program (FADAP) data, is discussed briefly. (Author)
AD-698 000 HC$3.00 MF$0.65

AUTOMATIC ANTISUBMARINE TRACK RECONSTRUCTION.
Master's thesis,
Naval Postgraduate School, Monterey, Calif.
Roger A. Garrett, and Albert P. Herrlinger. Oct 66, 73p
Distribution Limitation now Removed.

Descriptors: (*Antisubmarine warfare, *Hyperbolic navigation), Ranges (Distance), Errors, Sensors, Computer programs, Theses.
Identifiers: Omego navigation system.

The relative distance between various Antisubmarine Warfare vehicles is an important parameter for the evaluation of sensor equipment. This thesis presents a computer model, utilizing a time dependent error navigation system, Omega, for the determination of this relative distance parameter. A methodology for predetermining a relative distance error distribution for a specific area by simulating various Antisubmarine Warfare vehicle tracks from known navigational errors has been established. Attempts to smooth estimated tracks of Antisubmarine Warfare vehicles which receive the same time dependent navigational information simultaneously was found not to be advisable as this disturbs the correlation of navigation error between the vehicles. (Author)
AD-803 652 HC$3.00 MF$0.65

SOME SIMPLE PROOFS IN SEMI-MARKOFF PROCESSES.
Center for Naval Analysis, Arlington, Va. Operations Evaluation Group.
Joseph Bram. Feb 69, 16p OEG-Research Contrib-110
Contract N00014-68-A-0091
Distribution Limitation now Removed.

Descriptors: (*Antisubmarine warfare, Problem solving), Stochastic processes, Measure theory, Underwater tracking, Position finding.
Identifiers: *Semimarkov processes, Ergodic theory, Markov processes.

By invoking the ergodic theorem, most of the important averages of probabilistic systems that can be represented as semi-markoff systems can be obtained as limits of ratios, precisely as in the cases where the law of large numbers is applicable. The procedure is illustrated with several examples. (Author)
AD-849 854 HC$3.00 MF$0.65

15C. Defense

FACTS ON RADIATION AND FALLOUT. AN APPENDIX TO THE PROTOTYPE MANUAL ON CIVIL DEFENSE ASPECTS OF WATERWORKS OPERATION.
Engineering-Science, Inc., Arcadia, Calif.

Aug 64, 25p
Contract OCD-OS-62-106
See also AD-639 710. Distribution Limitation now Removed.

Descriptors: (*Nuclear weapons, Radioactive fallout), (*Civil defense systems, Water supplies), Surface burst, Radioactivity, Civil defense personnel, Half life, Radioactive decay, Countermeasures, Radiation measurement systems, Dosage, Dosimeters, Radiation effects.

Contents: Nuclear weapons and fallout; The atom and radioactivity; health hazards from radiation; Measurement of radiation and radioactivity; Radiological countermeasures.
AD-445 514 HC$3.00

IDEAS FOR MANAGERS: A DIGEST OF ACTIONS FOR INCREASING EFFICIENCY AND ECONOMY IN THE MANAGEMENT OF DEFENSE ACTIVITIES.
Assistant Secretary of Defense (Installations and Logistics) Washington D C
For primary bibliographic entry see Field 5A.
AD-697 990 MF$0.65

OPERATION FLAMBEAU - CIVIL DEFENSE EXPERIMENT AND SUPPORT: EYEWITNESS ACCOUNTS OF A MASS FIRE.
Naval Radiological Defense Lab San Francisco Calif
For primary bibliographic entry see Field 13L.
AD-698 135 HC$3.00 MF$0.65

15D. Intelligence

ISRAEL AND THE EASTERN ARAB STATES: A STRATEGIC SOURCE BOOK,
Research Analysis Corp Mclean Va
Bernard Reich, Andrea Arntsen, and James K. Walters. Oct 68, 99p Rept no. RAC-P-46

Descriptors: (*Middle East, Analysis), Israel, Geography, Petroleum industry, Sociology, Economics, Political science, Foreign policy, Foreign aid, Military intelligence, Commerce, Government (Foreign), Cold war, Bibliographies, Tables.
Identifiers: *Strategic intelligence, Arab Israeli relations, Political warfare, International relations.

Recent events in the Middle East, particularly the Arab-Israeli war of 1967, have once again highlighted the area as a focal point of interest and concern to the major world powers. The complexity of the region has been further evidenced by the factors involved in the 1967 conflict and its aftermath. This source book makes readily available a brief appraisal of factors of strategic significance in the Eastern Arab states and Israel. Accompanying the survey are charts, tables, other supporting data, and references assembled from numerous sources, both Middle Eastern and Western, and compiled in this paper to facilitate their use. It is intended that this survey will provide the user with an understanding of the factors at work in the Middle East, the data in support of the conclusions reached, and sources for more detailed examination of the subjects discussed. Although the compilation is focused on factors of a strategic nature, it is not intended to deal solely with that aspect of Israel and the Eastern Arab states. (Author)
AD-698 200 HC$3.00 MF$0.65

15E. Logistics

BUSIM. DYNAMIC INVENTORY MANAGEMENT SIMULATOR,
Ships Parts Control Center, Mechanicsburg, Pa.
For primary bibliographic entry see Field 5A.
AD-488 283 HC$3.00 MF$0.65

ANNUAL HISTORICAL SUMMARY, 1 JULY 1968 TO 30 JUNE 1969.
Defense Industrial Plant Equipment Center Memphis Tenn

Jun 69, 57p

Descriptors: (*Army equipment, Distribution), (*Department of Defense, Inventory control), Reviews, Research program administration, Management engineering, Industrial equipment.

The report is a summary of major events, problems, and accomplishments of the Defense Industrial

Plant Equipment Center (DIPEC) for Fiscal Year 1969. Some of the more noteworthy accomplishments occurred in the areas of equipment reutilization, which totaled $91.4 million for the year, and cost reduction where validated savings of $215,526 were achieved against an established goal of $75,000. Systems and procedures were completed for the transfer of selected classes within Federal Supply Groups 34 and 36 from the Military Services on 1 August 1969 for modified integrated management by DIPEC. (Author)
AD-697 958 HC$3.00 MF$0.65

AN APPROACH FOR MODELING THE US TRANSPORTATION SYSTEM FOR ANALYSIS OF EMERGENCY CAPABILITY,
Research Analysis Corp Mclean Va
Betty W. Holz. Mar 69, 32p Rept no. RAC-P-50

Descriptors: (*Transportation, Mathematical models), Linear programming, United States, Networks, Military requirements, Optimization, Simulation.
Identifiers: Network flows, Computerized simulation.

The report considers the problems of developing analytical tools for assessment of the adequacy of the continental US (CONUS) transportation system under a variety of postulated emergency situations that would stress the system through increased requirements for transportation or degradation of system capacity. The discussion covers the following topics: the types of emergency with which the methodology should be able to deal, the types of analysis to be performed, general specifications for the methodology, the proposed approach in terms of the analytical techniques to be used, and an illustrative formulation. (Author)
AD-698 202 HC$3.00 MF$0.65

ERGONOMICS IN THE DESIGN OF OFFICE FURNITURE: A REVIEW OF EUROPEAN LITERATURE.
Aerospace Medical Research Lab., Wright-Patterson AFB, Ohio.
For primary bibliographic entry see Field 5E.
AD-848 621 HC$3.00 MF$0.65

15F. Nuclear Warfare

URBAN CASUALITY ESTIMATION AND THE CIRCULAR COVERAGE FUNCTION. II.
Technical rept.,
Southern Methodist Univ Dallas Tex Dept of Statistics
Campbell R. Read. 17 Oct 69, 14p Rept no. THEMIS-SMU-TR-46
Contract N00014-68-A-0515
Report on Themis Signal Analysis Statistics Research Program.

Descriptors: (*Nuclear explosion damage, Urban areas), (*Nuclear warfare casualties, Mathematical prediction), Mathematical models, Statistical analysis, Circular error probable, Theorems.
Identifiers: Themis project.

In a previous paper a city distributed uniformly over a circle was considered in a model for an n-weapon attack using the circular normal damage function and aiming error developed by Hunter. The expected number of casualtities was evaluated using the Circular Coverage Function. We consider a single-weapon attack on a city having a circular normal distribution of population about the origin; the aiming error is assumed to be circular normal about the point of impact. The Circular Coverage Function, will figure in the evaluation of the expected number of casualties. Section 2 evaluates the expected casualties when the impact point is given, and in Section 3 an expression for the damage function, modified to include aiming error, is obtained. Section 4 estimates the expected casualties when the aiming point is given.
AD-697 936 HC$3.00 MF$0.65

OPERATION FLAMBEAU - CIVIL DEFENSE EXPERIMENT AND SUPPORT: EYEWITNESS ACCOUNTS OF A MASS FIRE.
Naval Radiological Defense Lab San Francisco Calif
For primary bibliographic entry see Field 13L.
AD-698 135 HC$3.00 MF$0.65

15G. Operations, Strategy, and Tactics

INDIVIDUAL AND TWO-MAN TEAM TARGET FINDING PERFORMANCE,
Miami Univ Oxford Ohio
For primary bibliographic entry see Field 5J.
AD-698 210

A GAME THEORY ANALYSIS OF PROPOSED STRATEGIES OF AN AERIAL SEARCH FOR A MOBILE SURFACE TARGET.
Master's thesis,
Naval Postgraduate School, Monterey, Calif.
Charles James Smith, Jr. Oct 66, 41p
Distribution Limitation now Removed.

Descriptors: (*Surface targets, Search theory), (*Game theory, Search theory), Operations research, Aerial reconnaissance, Target acquisition, Probability, Optimization, Military strategy, Detection, Reaction kinetics, Military tactics, Position finding, Mobility, Theses.

The thesis investigates the problem of aerial search for a mobile surface target. The initial position of the target is known, and a certain amount of time elapses before the search begins. The target has a variety of choices as to speed and direction, and the search aircraft has a choice of search patterns to be flown. The method proposed to solve the problem of maximizing or minimizing the probability of detection is the game theoretic analysis of various strategies available to the searcher and the evader. Four strategies for each are compared and evaluated, with optimal strategies, within the set of strategies investigated, being derived. (Author)
AD-807 385 HC$3.00 MF$0.65

16. MISSILE TECHNOLOGY

16C. Missile Warheads and Fuses

REENTRY VEHICLE DISPERSION DUE TO ATMOSPHERIC VARIATIONS.
Research paper,
Institute for Defense Analyses Arlington Va Science and Technology Div
Reinald G. Finke. Aug 69, 51p Rept no. RP-P-506
IDA/HQ-69-10761
Contract DAHC15-67-C-0011

Descriptors: (*Reentry vehicles, Descent trajectories), (*Atmosphere entry, *Meteorological parameters), Impact, Wind, Azimuth, Density, Aerodynamic configurations, Angle of attack, Roll, Ablation.

Reentry vehicle impact displacements due to a fixed perturbation in density or in wind speed in each 5-km-thick layer of the atmosphere up to 90-km altitude were derived from a series of machine reentry-trajectory calculations with the program RANGE for different R/V's and reentry conditions. Three arbitrary reentry vehicle shapes were chosen whose ballistic coefficients (550, 1025, and 1975 lb/sq ft) were representative of the range of interesting values. Reentry conditions were varied, from those of IRBM's of 15,000 ft/sec at 50-deg path angle, to those for ICBM's of 22,500 ft/sec at 20-deg path angle, and reentry azimuths were varied from direct equatorial (tail wind) to retrograde equatorial (head wind). Intermediate reentry conditions were included to define the dependences well enough for interpolation, and even slight extrapolation, to all known interesting combinations. The resulting layer-wise miss contributions from the most influential 5-km layers (centered at 5- and 10-km altitude) vary from about 200 ft for 1 percent change in density. (Author)
AD-697 925 HC$3.00 MF$0.65

MINIMUM ENERGY HYPERSONIC NOSE AND LEADING EDGE SHAPES,
Naval Ship Research and Development Center Washington D C Aerodynamics Lab
For primary bibliographic entry see Field 20D.
AD-697 951 HC$3.00 MF$0.65

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

THE NSMC SONAR OPERATOR ALERTNESS RESEARCH APPARATUS: DESCRIPTION AND INSTRUCTIONS FOR USE.
Naval Submarine Medical Center, Groton, Conn.
For primary bibliographic entry see Field 5J.
AD-477 357 HC$3.00 MF$0.65

LOCATING AND SYNCHRONIZING FLIGHT RESEARCH TRACKING STATIONS,
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 17G.
N64-10073 HC$3.00 MF$0.65

17B. Communication

AN OPERATIONALLY ORIENTED PERFORMANCE CONTROL MODEL.
Technical rept.,
IIT Research Inst., Annapolis, Md.
S. I. Cohn, and F. C. Pethel. Jan 66, 37p ESD-TR-66-2
Contract AF 19 (628)-5049
Distribution Limitation now Removed. See also AD-478 024.

Descriptors: (*Radiofrequency interference, *Mathematical models), Environment, Effectiveness, Electromagnetic compatibility, Spectrum signatures, Transmitter-Receivers, Radio relay systems, Frequency shift, Control systems.
Identifiers: AN/GRC-26, AN/TRC-24.

The paper presents an environmental analysis technique using a frequency-distance separation criteria that can rapidly be applied to large environmental problems. The types of data inputs required to effect an execution of the analysis are discussed in light of the present ecac synthesis capabilities. An emphasis is put on the presentation of outputs to yield easily understandable and rapidly applicable results. Due to redundancy in equipments, large environments can generally be described by a relatively few different types. The smaller the number of equipment types the more efficient the analysis will be. Although the method was originally conceived as an internal effort, the advantages of applying such an analysis either manually or by means of tactical data processing systems are obvious. (Author)
AD-477 501 HC$3.00 MF$0.65

BASE NON-TACTICAL COMMUNICATIONS INTERFERENCE STUDY.
Technical rept.,
IIT Research Inst., Annapolis, Md.
M. Kelly. Feb 66, 62p ESD-TR-66-1
Contract AF 19 (628)-5049
Distribution Limitation now Removed. See also AD-477 501.

Descriptors: (*Radio communication systems, *Electromagnetic compatibility), (*Radio interference, Reduction), Air force equipment, Very high frequency, Equations, Ranges (Distance), Distortion, Modulation, Frequency, Selection, Radio transmitters, Radiofrequency power.
Identifiers: Communication channels.

Simplified equations for computing required separation distances to prevent cosite and intersite interference situations among airbase and nontactical communications systems are developed and presented. An analysis of intermodulation, Adjacent channel and co-channel interference and current deployments and frequency assignments indicate that interference is not only possible but very probable. It is concluded that the use of reduced transmitter powers and channel sharing techniques is necessary to alleviate the interference situation. A tabular method for computing third-order intermodulation products within the base non-tactical frequency family is also presented. (Author)
AD-478 024 HC$3.00 MF$0.65

SURVEY OF THE POSSIBILITY OF SHORT-RANGE RADIO PREDICTIONS FROM METEOROLOGICAL DATA.
Technical memo.,
Institute for Telecommunication Sciences Boulder Colo
L. P. Riggs, and C. A. Samson. Feb 68, 95p Rept no. ITS-116

Descriptors: (*Radio transmission, Meteorological parameters), Troposphere, Refracture index, Convection (Atmospheric), Surface temperatures, Temperature inversion, Sea breeze, Thunderstorms, Wind, Fog, Clouds, Air mass analysis, Rainfall.
Identifiers: Advection, Monsoons, Stratification.

The results of a literature survey of weather-related effects on tropospheric radio propagation are summarized and presented in tabular form. Consideration of the available weather data, the prediction probability for various weather factors, and the limited knowledge of radio-weather relationships, leads to the conclusion that only very limited propagation predictions based on weather data are possible at present. (Author)
AD-697 884 HC$3.00 MF$0.65

PERFORMANCE OF TACTICAL PULSE-CODE MODULATION SYSTEMS UTILIZING MULTIPLEXER TD-352/U.
Final rept.,
Army Electronics Command Fort Monmouth N J
Bernard J. Keigher, Peter Zakanycz, Robert L. Elzner, Salvatore J. Manno, and Eric C. Christenson. Oct 69, 110p Rept no. ECOM-3190

Descriptors: (*Multichannel telephone systems, *Pulse code modulation), Multiplex, Intelligibility, Test methods, Attenuation, Signal-to-noise ratio, Voice communication systems, Data transmission systems, Teletype systems.
Identifiers: TD-352/U multiplexers, AN/TCC type equipment.

A test program was undertaken to determine the performance of tactical PCM systems with respect to word intelligibility as a function of various system configurations, and to determine the characteristics which limit such performance. This report covers the detailed procedures and results of Phase II of this program. The Fairbanks Rhyme Test was employed to determine the word intelligibility of numerous laboratory and field-deployed PCM systems, using 2-wire and 4-wire audio interconnections, and varying the losses in the audio terminations. Electrical measurements of selected parameters were made on the systems tested to permit correlation of the percent word intelligibility with readily measured parameters. The results indicate that 4-wire systems provide better performance than 2-wire systems of equivalent length. The limitations of 2-wire PCM systems are due to the inherent losses in the audio interconnections. However, there is no practical limit on the length of 4-wire tactical systems, since the 4-wire systems are essentially loss-free. Also, the results disclose that PCM system performance can be readily predicted knowing the system configuration with audio interconnection losses, or knowing the overall system loss and the measured signal-to-quantized noise ratio of the system. (Author)
AD-698 029 HC$3.00 MF$0.65

FEASIBILITY OF APPLYING FIBER OPTICS IN LINEAR MEASUREMENTS BY TELEVISION METHODS,
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 20F.
AD-698 080 HC$3.00 MF$0.65

DYNAMIC DIFFUSER LOUDSPEAKERS.
Army Foreign Science and Technology Center Washington D C

17 Nov 69, 20p Rept no. FSTC-HT-23-305-69
Trans. of Russian State Standard GOST-9010-67.

Descriptors: (*Loudspeakers, Standards), Reliability (Electronics), Acceptability, USSR.
Identifiers: Translations.

Government standards for dynamic diffuser loudspeakers (GOST 9010-67) include those with round or oval diffusers, with simple or complex portable systems. They are designed for use in radio, television, and various types of sound recording instruments. The standard covers basic parameters, giving data for a number of types of loudspeakers. Test methods to check performance and construction of loudspeakers is given. Requirements for labelling, packaging, transporting, and storage are included. (Author)
AD-698 084 HC$3.00 MF$0.65

PROPAGATION OF RADIO WAVES,
Foreign Technology Div Wright-Patterson AFB Ohio
G. P. Grudinskaya. 12 Aug 69, 324p Rept no. FTD-MT-24-382-68
Edited machine trans. of mono. Rasprostranenie Radiovoln, Moscow, 1967 p1-244.

Descriptors: (*Radio transmission, Textbooks), Radio communication systems, Atmosphere, Terrestrial magnetism, Radio waves, Propagation, USSR.
Identifiers: Translations.

The textbook discusses the effect of the Earth's surface (curvature, surface roughness, soil nonuniformity, etc.) on the propagation of radio waves both near and far from the Earth. Also discussed are: the structure of the Earth's atmosphere (the troposphere, the outer and inner ionosphere, radiation belts), the radiophysical parameters of the atmosphere, the effect of the Earth's permanent magnetic field, and the propagation of radiowaves of various bands (especially ultrashort waves).
AD-698 104 HC$3.00 MF$0.65

PERCEPTION OF LANGUAGE. PART I.
Pittsburgh Univ Pa Learning Research and Development Center
For primary bibliographic entry see Field 5G.
AD-698 131 HC$3.00 MF$0.65

PERCEPTION OF LANGUAGE. PART II.
Pittsburgh Univ Pa Learning Research and Development Center
For primary bibliographic entry see Field 5G.
AD-698 132 HC$3.00 MF$0.65

ANALYSIS OF VOCAL BEHAVIOR.
Final rept. 1 May 65-30 Jun 69,
California Univ San Francisco School of Medicine
John A. Starkweather. Jul 69, 77p
Contract Nonr-3656 (28)

Descriptors: (*Speech, Analysis), Acoustic properties, Voice communication systems, Digital computers, Spectrum analyzers, Emotions, Pattern recognition.
Identifiers: Computer analysis.

The research had as its objectives: (1) To develop acoustic measures of the voice to provide a useful monitor of the behavioral and emotional state of a speaker who is using a voice communication channel, (2) To explore and develop computer programs for pattern recognition of complex acoustic data to enable rapid processing, feedback of results, and adjustment of parameters for further work, and (3) To investigate the feasibility of equipment for the assessment of the behavioral state of personnel located at remote locations. A spectrum analyzer was developed appropriate to obtain time-averaged acoustic spectra of continuous speech which is converted into digital form for data reduction and analysis by off-line computer. The report describes the instrumentation developed for acoustic analysis and its connection to a computer providing graphic display and digital magnetic tape, the use of this tape on a larger computer for statistical analysis and an investigation of similarity of results with previous work. (Author)
AD-698 142 HC$3.00 MF$0.65

R-390A/URR DIGITAL FREQUENCY READOUT UNIT.
Syracuse Univ Research Corp N Y Defense Systems Div
For primary bibliographic entry see Field 14B.
AD-698 190 HC$3.00 MF$0.65

FUTURE LAND-MOBILE COMMUNICATIONS,
Research Analysis Corp Mclean Va
F. R. Eldridge. Jan 69, 19p Rept no. RAC-P-48

Descriptors: (*Radio communication systems, Mobile), (*Multipath transmission, Advanced planning), Transmitter-receivers, Statistical analysis, Passenger vehicles, Population, Radio waves, Queueing theory, Switching circuits, Antenna radiation patterns, Costs, Cost effectiveness.

Numerous reports have indicated the impending critical shortage, within large metropolitan areas, of frequencies allocated to certain of the land-mobile radio services, including those used by police, fire, taxi, business, special industrial, 'domestic public,' and other land-mobile services. In this paper some possible long-range objectives of land-mobile radio systems are examined; several effective ways of improving present systems to achieve these objectives are discussed; and conclusions are drawn regarding the study programs that should be undertaken to initiate these improvements. (Author)
AD-698 201 HC$3.00 MF$0.65

RELATIVE PERCEPTUAL SIMILARITY OF SIXTY INITIAL CONSONANTS.
Technical rept.,
Ohio State Univ Columbus Dept of Speech
John W. Black. Nov 69, 30p Rept no. RF-2928-TN-1
Contract N00014-67-A-0232-0003

Descriptors: (*Speech, *Phonetics), Factor analysis, Auditory perception.
Identifiers: *Consonants.

The study reported treated the relationship among 59 consonants and consonantal clusters plus the instance of 'the absence of an initial consonant'; a total of 60 manners of commencing one-syllable words. The 60 ways of beginning one-syllable words were nearly exhaustive except that initial vowel sounds were not compared. The results of the study confirm the earlier approach (direct magnitude estimation) as one that can be used in assig-

ning degrees of similarity-dissimilarity to initial consonants and clusters. Values obtained in this manner can be subjected satisfactorily to factor analysis. The outcome suggests that place of articulation, stop-continuant features, degrees of friction, and glide-like aspects of consonants contribute importantly to grouping the consonants on the basis of similarity. A number of applications of the results seem possible and are in prospect. The grading of aural material to facilitate speech perception has many ramifications; for example, in code-words and auditory training. (Author)
AD-698 205 HC$3.00 MF$0.65

SUBJECTIVE ANALYSIS OF SPEECH IN HELIUM ENVIRONMENTS,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 6K.
AD-698 222

DEVELOPMENT OF A SOLID-STATE MATRIX DISPLAY.
Final rept. 1 May 65-31 May 66,
RCA Labs., Princeton, N.J.
Bernard J. Lechner, George W. Taylor, and Juri Tults. Jul 67, 159p AFFDL-TR-67-71
Contract AF 33 (615)-2531
Distribution Limitation now Removed.

Descriptors: (*Television display systems, Integrated circuits), Ferroelectric materials, Electroluminescence, Analog systems, Lead compounds, Zirconium compounds, Tin compounds, Titanium compounds, Niobium compounds, Oxides, Ceramic materials, Shift registers, Phosphorescent materials.

The object of the program was to perform continuing work on a solid-state matrix display capable of presenting two-dimensional video information. The work was directed toward perfecting the techniques required to provide distributed control of a solid-state matrix display. The main emphasis was on developing the necessary scanning and driving circuitry to demonstrate the overall goal of combining the best characteristics of electroluminescent phosphors with those of ferroelectric ceramics, thereby achieving a simple, reliable solid-state matrix display. The work included studies of scanning and driving circuitry, studies of panel design, studies of fabrication techniques, selection of electroluminescent cells for best match with ferroelectric transchargers, and the construction of a 1200-element model display to permit evaluation of the techniques that were developed. Ultimate performance goals included a geometric resolution of 10 elements per inch, a continuous dynamic brightness in excess of 15 ft-L, a zero ambient contrast ratio in excess of 20 to 1, a useful life of at least 1000 hours, capability for producing a gray scale by independently controlling the brightness of any display element, and a frame rate that allows continuity of motion without objectionable blurring or perceptible flicker.
AD-819 555 HC$3.00 MF$0.65

COMMUNICATIONS: INTRODUCTION TO SATELLITE COMMUNICATIONS.
Army Strategic Communications Command, Fort Huachuca, Ariz.
15 Feb 68, 335p USASCC-PAM-105-5
Supersedes AD-818 48!. Distribution Limitation now Removed.

Descriptors: (*Communication satellites (Active), Instruction manuals), (*Military satellites, *Instruction manuals), (*Ground support equipment, Communication satellites (Active)), (*Space communication systems, Instruction manuals), Military requirements, Orbital trajectories, Radio relay systems, Communication equipment, Radio jamming, Radio antijamming, Multiplex, Command+ control systems, Semiconductor devices, Computer logic, Logic circuits, Servomechanisms, Performance (Engineering), Communication satellites (Passive), Design, Antennas, Noise (Radio), Signal-to-noise ratio, Modulation, Data transmission systems.
Identifiers: IDCSP (Interim Defense Communication Satellite Program), Interim defense communication satellite program, Multiple access, Modems.

The purpose of the document is to introduce the fundamental techniques involved in satellite communications and to present some of the technology that personnel assigned to satellite communications ground stations must master if they are to become an efficient and effective work force. The pamphlet may be utilized as a supplementary text in the satellite communications training courses. Also, it may serve as an information type text for personnel not directly concerned with the satellite communications program, but who desire a general knowledge of the principles and techniques employed in the program. (Author)
AD-830 471 HC$3.00 MF$0.65

LOCATING AND SYNCHRONIZING FLIGHT RESEARCH TRACKING STATIONS,
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 17G.
N64-10073 HC$3.00 MF$0.65

TELEVISION BROADCAST SATELLITE (TVBS) STUDY RESEARCH AND TECHNOLOGY IMPLICATIONS REPORT, VOLUME 2.
General Electric Co., Philadelphia, Pa. Valley Forge Space Center.
R. W. Hesselbacher. 6 Oct 69, 59p NASA-CR-72511
Contract NAS3-9708

Descriptors: *Research and development, *Spacecraft communication, *Telecommunication, *Television equipment, Arrays, Control, Electric potential, Predictions, Transmitters.

For abstract, see STAR 07 24.
N69-40103 HC$3.00 MF$0.65

TELEVISION BROADCAST SATELLITE STUDY FINAL REPORT.
TRW Systems Group, Redondo Beach, Calif.
J. Jansen, and P. L. Jordan. 24 Oct 69, 546p NASA-CR-72510, TRW-08848-6002-R0-00
Contract NAS3-9707

Descriptors: *Broadcasting, *Communication satellites, *Telecommunication, *Television equipment, Research and development, Satellite television, Systems engineering, Technologies, Television receivers.

For abstract, see STAR 07 24.
N69-40125 HC$3.00 MF$0.65

EVALUATION OF DEVELOPMENT COSTS AND POSSIBILITIES OF DIRECT TELEVISION SATELLITES.
Abschaetzung Der Beschaffungskosten Und-Moeglichkeiten Im Raumfahrtsektor Beim Satelliten-direkt-fernsehen
European Space Vehicle Launcher Development Organization, Paris (France).
P. Kotowski. Sep 69, 11p ELDO-PUBL-23
Lang- in German Conf- Presented At the Colloq. on Direct Satellite Broadcasting, Hamburg, 9-10 Sep. 1969

Descriptors: *Communication satellites, *European space programs, *Satellite television, Cost estimates, Europa launch vehicles, Synchronous satellites, Telecommunication, Television transmission.

For abstract, see STAR 07 24.
N69-40214 HC$3.00 MF$0.65

RESULTS OF PROPAGATION TESTS RUN AT 11 G HZ AND 18 G HZ ON TWO LINES OF DIFFERENT LENGTH.
Risultati Di Prove Di Propagazione A 11 Ghz E 18 Ghz Sa Due Collegamenti Di Diversa Lunghezza
Aztec School of Languages, Inc., Maynard, Mass. Research Translation Div.
G. B. Stracca. Oct 69, 80p NASA-TT-F-12545
Contract NASW-1692
Coll- 80 P Refs Tran- Transl. Into English From Italian Report

Descriptors: *Line spectra, *Propagation, *Statistical analysis, *Very high frequencies, Italy, Meteorological charts, Microwaves, Precipitation (meteorology).

For abstract, see STAR 07 24.
N69-40331 HC$3.00 MF$0.65

APOLLO COMMUNICATIONS SYSTEMS - LUNAR MULTIPATH SIGNAL CHARACTERISTICS.
TRW Systems Group, Redondo Beach, Calif. Electronic Systems Lab.
H. W. Belles. 15 Oct 69, 29p NASA-CR-101974, TRW-11176-H368-R000
Contract NAS9-8166

Descriptors: *Lunar module, *Lunar orbits, *Moon, *Multipath transmission, *Radio signals, Apollo 12 flight, Frequency modulation, Ground stations, Lunar topography, Pulse modulation, Steerable antennas.

For abstract, see STAR 07 24.
N69-40569 HC$3.00 MF$0.65

DISPLAY PROCESSOR FOR IMPROVED APOLLO TV CAMERA FINAL REPORT.
Westinghouse Electric Corp., Pittsburgh, Pa.
10 Oct 69, 6p NASA-CR-101973
Contract NAS9-8787

Descriptors: *Apollo spacecraft, *Computers, *Performance tests, *Television cameras, Calibrating, Display devices, Quality control.

For abstract, see STAR 07 24.
N69-40571 HC$3.00 MF$0.65

TELEVISION BROADCAST SATELLITE (TVBS) STUDY, VOLUME 3.
General Electric Co., Philadelphia, Pa. Valley Forge Space Center.
R. W. Hesselbacher. 15 Nov 69, 360p NASA-CR-72579
Contract NAS3-9708

Descriptors: *Broadcasting, *Cost analysis, *Satellite television, *Systems analysis, *Technologies, Evaluation, Satellite transmission, Systems engineering.

For abstract, see STAR 07 24.
N69-41167 HC$3.00 MF$0.65

17C. Direction Finding

COMPARATIVE EFFICIENCY OF MONOPULSE RADAR DIRECTION-FINDING SYSTEMS,
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 17I.
AD-698 160 HC$3.00 MF$0.65

17D. Electromagnetic and Acoustic Countermeasures

PROBABILITY OF GATE STEAL AS A FUNCTION OF OSCILLATOR STABILITY.
Technical rept.,

IIT Research Inst., Annapolis, Md.
F. L. Marek. May 66, 26p ESD-TR-66-4
Contract AF 19 (628)-5049
Distribution Limitation now Removed. See also AD-477 665.

Descriptors: (*Radar jamming, *Radiofrequency interference), (*Range gating, *Radar deception), Oscillators, Radar echo areas, Radar tracking, Radar targets, Pulse discriminators, Stability, Signal-to-noise ratio, Functions, Electromagnetic compatibility.

The apparent velocity of a false target from an interferer with pulse repetition frequency (PRF) equal to the victim system's PRF is found as a function of the oscillator instabilities of the two systems. The probability of track break as a function of oscillator instability, interference-to signal ratio, and target velocity is found. (Author)
AD-482 996 HC$3.00 MF$0.65

17G. Navigation and Guidance

ACCELERATED LIFE TESTING OF GUIDANCE COMPONENTS.
Rept. for Dec 63-Jul 64,
Autonetics, Anaheim, Calif.
B. B. Winter, C. A. Denison, H. J. Hietala, and F. W. Greene. Sep 64, 342p AFAL-TDR-64-235
Contract AF 33 (615)-1157
Distribution Limitation now Removed.

Descriptors: (*Guidance, Accelerated testing), Life expectancy, Reliability, Failure (Mechanics), Gyroscopes, Space navigation.

The report deals with theoretical developments necessary for accelerated testing, with specific hardware considerations. In the theoretical area, the currently prevalent approach to accelerated testing is described and analyzed, and is found inadequate. A comparative discussion of various failure models is presented, and those most amenable to meaningful accelerated testing are developed in detail. Models for devices with multiple failure modes are described, and pertinent estimation procedures are reviewed. A new method for efficient estimation of the failure distribution of repairable equipment is presented. In the hardware area, the report includes a detailed examination of several space guidance components, with emphasis on considerations pertinent to accelerated testing, and specific applications of accelerated testing to space guidance components are recommended. The phenomenon of metallic creep is examined from the standpoint of its relation to failures of space guidance components, and methods of accelerated estimation of creep behavior are examined. (Author)
AD-448 079 HC$3.00

COMPUTER/SIMULATION STUDY OF AIR DERIVED SEPARATION ASSURANCE SYSTEMS IN MULTIPLE AIRCRAFT ENVIRONMENT.
Collins Radio Co Cedar Rapids Iowa
For primary bibliographic entry see Field 1B.
AD-697 942 HC$3.00 MF$0.65

AUTOMATIC ANTISUBMARINE TRACK RECONSTRUCTION.
Naval Postgraduate School, Monterey, Calif.
For primary bibliographic entry see Field 15A.
AD-803 652 HC$3.00 MF$0.65

LOCATING AND SYNCHRONIZING FLIGHT RESEARCH TRACKING STATIONS,
Advisory Group for Aeronautical Research and Development, Paris (France).
Edward Durbin. Jul 62, 63p AGARD-407
NATO furnished. Presented at Meeting of the Flight Mechanics Panel of AGARD (21st), Paris, 6-10 Jul 62.

Descriptors: (*Space surveillance systems, Tracking), (*Navigational aids, Shipborne), Inertial navigation, Doppler navigation, Hyperbolic navigation, Sonar beacons, Accuracy, Time-interval counters, Errors, Position finding.
Identifiers: Loran.

Mobile tracking ships are being used to an increasing extent as scientific activity in space continues to expand. The report describes the various navigation systems which are known and examines the fundamental accuracy limitations of each type. (Author)
N64-10073 HC$3.00 MF$0.65

REDUCING MULTIPATH ERROR IN AN ANGLE-MEASURING NAVIGATION SATELLITE SYSTEM INTERIM TECHNICAL REPORT.
Pennsylvania Univ., Philadelphia. the Moore School of Electrical Engineering.
R. A. Hrusovsky. Sep 69, 74p NASA-CR-106353, REPT-70-07
Contract NGR-39-010-087

Descriptors: *Multipath transmission, *Navigation satellites, *Position errors, *Signal reflection, Optimal control, Phase error, Phase switching interferometers, Sweep frequency.

For abstract, see STAR 07 24.
N69-40075 HC$3.00 MF$0.65

DEVELOPMENT OF AN ALL-ELECTRONIC STAR SENSOR WITH IMAGE DISSECTOR TUBE.
Entwicklung Eines Vollelektronischen Sternsensors Mit Image-dissector-rohre
Techtran Corp., Glen Burnie, Md.
W. Bross. Oct 69, 18p NASA-TT-F-12646, BMWF-FB-W-68-76
Contract NASW-1695
Coll- 18 P Refs Tran- Transl. Into English From German Reports Bmwf-fb, W68-76

Descriptors: *Electronic equipment, *Guidance sensors, *Image dissector tubes, *Star trackers, Life (durability), Performance tests, Radiation effects, Satellite orientation, Scanning.

For abstract, see STAR 07 24.
N69-40343 HC$3.00 MF$0.65

MARINER MARS 1969 NAVIGATION, GUIDANCE, AND CONTROL.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
J. R. Scull. 1969, 17p NASA-CR-106494
Contract NAS7-100

Descriptors: *Engineering drawings, *Flight tests, *Mariner spacecraft, *Mechanization, *Radio navigation, Attitude control, Computers, Guidance (motion), Launch windows, Reliability, Trajectories.

For abstract, see STAR 07 24.
N69-41014 HC$3.00 MF$0.65

DRIFT COMPONENTS IN INERTIAL GYROSCOPIC SYSTEMS.
Componenti Di Drift in Sistemi Giroscopici Di Tipo Inerziale
Rome Univ. (Italy).
G. Manarini. Feb 69, 65p
Lang- in Italian Seri- Its No. 20

Descriptors: *Drift (instrumentation), *Gyroscopes, *Inertial guidance, Dynamic characteristics, Feedback control.

For abstract, see STAR 07 24.
N69-41221 HC$3.00 MF$0.65

ON OPTIMAL SCHEDULING AND HOLDING STRATEGIES FOR THE AIR TRAFFIC CONTROL PROBLEM.
Massachusetts Inst. of Tech., Cambridge. Electronic Systems Lab.
L. W. Porter. Sep 69, 94p NASA-CR-106400, ESL-R-401
Contract NGL-22-009-124

Descriptors: *Air traffic control, *Feedback control, *Linear systems, *Optimization, Aircraft approach spacing, Aircraft guidance, Algorithms, Computerized simulation.

For abstract, see STAR 07 24.
N69-41241 HC$3.00 MF$0.65

17H. Optical Detection

STUDY OF A NONLINEAR PULSED PHOTOELECTRIC SYSTEM OF AUTOMATIC TRACKING,
Army Foreign Science and Technology Center Washington D C
S. T. Shashkova. 19 Nov 69, 10p Rept no. FSTC-HT-23-152-70
Trans. of Optiko-Mekhanicheskaya Promyshlennost (USSR) v35 n7 p4-8 1968.

Descriptors: (*Optical tracking, Light pulses), Optical equipment, Sensors, Nonlinear systems, Control systems, USSR.
Identifiers: Translations.

An optical-photoelectric automatic tracking system is examined that follows a pulsed light source and is intended for the measurement of the angular coordinates and angular velocity of the line of sight. It is a pulsed nonlinear automatic control system. These properties are in its receiving element. The sensing element is divided into a series of areas operating on the 'yes-no' principle, thus making it possible to use the simplest electronic device.
AD-698 081 HC$3.00 MF$0.65

DYNAMIC DISTORTION OF A GIMBALED TELESCOPE.
Bellcomm, Inc., Washington, D. C.
G. M. Anderson. 21 May 69, 48p NASA-CR-106457, TM-69-1022-3
Contract NASW-417

Descriptors: *Analysis (mathematics), *Distortion, *Gimbals, *Telescopes, Beams (radiation), Decoupling, Loads (forces), Stability.

For abstract, see STAR 07 24.
N69-40798 HC$3.00 MF$0.65

THE R.A.R.D.E. PORTABLE VISIBILITY RECORDER.
Royal Armament Research and Development Establishment, Fort Halstead (England).
B. Bestley, G. H. Crockett, and E. Parry. May 69, 18p AD-691588, RARDE-MEMO-17/69

Descriptors: *Night vision, *Portable equipment, *Target recognition, Electronic equipment, Photomultiplier tubes, Time lag.

For abstract, see STAR 07 24.
N69-40836 HC$3.00 MF$0.65

RESOLVABILITY OF OBJECTS FROM THE STANDPOINT OF STATISTICAL PARAMETER ESTIMATION.
California Univ., La Jolla. Dept. of Applied Physics and Information Science.
C. W. Helstrom. 1969, 30p NASA-CR-106404
Contract NGR-05-009-079

Descriptors: *Apertures, *Estimates, *Optical properties, *Radiance, *Spectral resolution, Field theory (physics), Optical correction procedure,

Parameterization, Physical optics, Statistical analysis.

For abstract, see STAR 07 24.
N69-40875 HC$3.00 MF$0.65

17I. Radar Detection

STUDY OF DOPPLER SPECTRA OF RADAR SEA-ECHO,
Naval Research Lab Washington D C
G. R. Valenzuela, and M. B. Laing. 3 Nov 69, 58p
Rept no. NRL-6934

Descriptors: (*Radar clutter, Ocean waves), Mathematical models, Doppler effect, Scattering, Radar reflections, Power spectra.

Doppler spectra of radar sea-echo were investigated theoretically and experimentally. Electromagnetic scattering models were developed with composite rough surfaces, i.e., Bragg resonant water waves superimposed on a carrier water wave; and basic concepts in hydrodynamics were developed for a gravity were of finite height. New experimental results on spectra of radar sea-echo from the Four-Frequency Radar (428 MHz, 1228 MHz, 4455 MHz, and 8910 MHz), for sea conditions which ranged from 1 to 2 ft waves and 1 to 2 knot winds to 26-ft waves and 46 to 48 knot winds, show that the bandwidth of radar sea-echo is polarization and frequency dependent, and the differential doppler, between horizontal and vertical polarization, is frequency and depression angle dependent. Both the 'noisiness' of the spectra and the greater spectral width of the horizontal return indicate spray over the sea might be the mechanism responsible for the dependencies observed. (Author)
AD-698 117 HC$3.00 MF$0.65

COMPARATIVE EFFICIENCY OF MONOPULSE RADAR DIRECTION-FINDING SYSTEMS,
Army Foreign Science and Technology Center Washington D C
E. F. Sviridov. 7 Nov 69, 145p Rept no. FSTC-HT-23-314-69
Trans. of mono. Sravnitelnaya Effektivnost Monoimpulsnykh Radiolokatsionnykh Sistem Pelengatsii, Leningrad, 1964 115p.

Descriptors: (*Monopulse radar, *Direction finding), Efficiency, Radar pulses, Phase (Electronics), Accuracy, Statistical analysis, USSR.
Identifiers: Translations.

The book is concerned with the estimation of the efficiency of monopulse radar direction-finding systems. Circuits of monopulse systems are studied from the standpoint of the unified theory, signal processing rules are formulated, functional diagrams drawn in accordance with the processing rules are synthesized, and specifications for the basic elements of the functional diagrams at various signal shapes are considered. An analysis of the maximum accuracy of monopulse direction finding is carried out for a determinate signal and for a signal with random parameters at an arbitrary target location in the coverage area, and the functional diagrams of optimal resolvers at phase and amplitude direction finding are determined along with the principles of distribution of optimal estimation of angular position.
AD-698 160 HC$3.00 MF$0.65

DISCRIMINATING AND PROCESSING INFORMATION IN DOPPLER SYSTEMS,
Army Foreign Science and Technology Center Washington D C
G. I. Tuzov. 12 Nov 69, 273p Rept no. FSTC-HT-23-596-69
Trans. of mono. Vydelenie I Obrabotka Informatsii y Dopplerovskikh Sistemakh, Moscow, 1967 255p.

Descriptors: (*Doppler radar, Data processing systems), Velocity, Electric filters, Tuning devices, Frequency, USSR.
Identifiers: Signal processing, Translations.

The book deals with radio systems which are intended for discriminating and processing information about the speed of movement of objects. The ultimate precision of doppler systems employing a continuous signal is evaluated and the structure of a receiving-measuring channel is analyzed together with the most important parts of it: tracking filters, converters for converting information about the speed of movement into a voltage and a digital code, and a system for signal search based on frequency. (Author)
AD-698 161 HC$3.00 MF$0.65

MODIFICATION OF 16.5 G HZ SIDE-LOOKING RADAR SYSTEM FOR NASA C-130 AIRCRAFT FINAL REPORT.
Philco-ford Corp., Newport Beach, Calif. Aeronutronic Div.
R. E. Mc Cain. 30 Sep 69, 20p NASA-CR-101746, PUBL-U-4710
Contract NAS9-9116

Descriptors: *C-130 aircraft, *Earth resources program, *Side-looking radar, Earth resources, Installing, Revisions.

For abstract, see STAR 07 24.
N69-40391 HC$3.00 MF$0.65

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

CURVES FOR PREDICTING STRESSES IN CONTROLLED FUSION PULSED MAGNETIC FIELD SYSTEMS,
Los Alamos Scientific Lab., N. Mex.
D. A. Baker, and L. W. Mann. 23 May 69, 16p
Contract W-7405-eng-36

Descriptors: (*Plasma physics, *Electromagnets), Stresses, Pulse systems.

For abstract, see NSA 23 23.
LA-4186 HC$3.00 MF$0.65

TRITIUM BREEDING AND ENERGY GENERATION IN LIQUID LITHIUM BLANKETS,
California Univ., Livermore. Lawrence Radiation Lab.
J. D. Lee. 27 Aug 69, 22p CONF-690901-3
Presented at the International Conference on Nuclear Fusion Reactors, Culham (England), 17-19 Sep 69.

Descriptors: (*Thermonuclear reactions, Lithium), Tritium, Reactor materials.

For abstract, see NSA 23 23.
UCRL-71757 HC$3.00 MF$0.65

THE MODULE APPROACH TO BLANKET DESIGN: A VACUUM WALL FREE BLANKET USING HEAT PIPES,
California Univ., Livermore. Lawrence Radiation Lab.
R. W. Werner. 13 Aug 69, 38p CONF-690901-2
Presented at the International Conference on Nuclear Fusion Reactors, Culham (England), 17-19 Sep 69.

Descriptors: (*Thermonuclear reactions, *Heat exchangers), Pipes, Vacuum.
Identifiers: Heat pipes.

For abstract, see NSA 23 23.
UCRL-71758 HC$3.00 MF$0.65

PRELIMINARY DESIGN CONSIDERATIONS FOR AN ASTRON POWER REACTOR SYSTEM,
California Univ., Livermore. Lawrence Radiation Lab.
R. W. Werner, B. Myers, P. B. Mohr, J. D. Lee, and N. C. Christofilos. 22 Aug 69, 38p CONF-690901-4
Presented at the International Conference on Nuclear Fusion Reactors, Culham (England). 17-19 Sep 69.

Descriptors: (*Thermonuclear reactions, Confinement), Power reactors, Magnetic fields, Plasma physics, Reactor system components, Design.
Identifiers: *Thermonuclear reactors, Astron thermonuclear reactor.

For abstract, see NSA 23 23.
UCRL-71768 HC$3.00 MF$0.65

18B. Isotopes

MEASUREMENTS OF THE THORON CONCENTRATION OF THE LOWER ATMOSPHERE IN RELATION TO THE EXCHANGE IN THIS REGION.
Technische Hochschule Aachen (West Germany) Forschungsstelle Fuer Geophysik Und Meteorologie
For primary bibliographic entry see Field 4A.
AD-698 034 HC$3.00 MF$0.65

DEVELOPMENT OF SOME RADIOISOTOPE PROCEDURES FOR MEASURING WATER MOVEMENT IN TREES,
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
For primary bibliographic entry see Field 2F.
For abstract, see NSA 23 23.
TID-25136 HC$3.00 MF$0.65

18C. Nuclear Explosions

NEUTRON AND SECONDARY GAMMA-RAY TRANSPORT IN INFINITE HOMOGENEOUS AIR,
Oak Ridge National Lab Tenn
For primary bibliographic entry see Field 18F.
AD-697 901 HC$3.00 MF$0.65

REVIEWS TO INSURE SAFETY OF NUCLEAR OPERATIONS.
Nevada Operations Office (AEC), Las Vegas.

Jul 69, 13p

Descriptors: (*Nuclear explosions, Safety), Health physics, Underground explosions.

For abstract, see NSA 23 23.
NVO-48 HC$3.00 MF$0.65

STUDY METHODS FOR THE DRILLINGS AROUND THE UNDERGROUND NUCLEAR EXPLOSIONS IN THE SAHARA. PART 1 - STUDY OF ROCK SAMPLES.
Methodes D'etude des Forages Realises Autour des Explosions Nucleaires Souterraines Au Sahara. Premiere Partie - Etude des Echantillons de Roche
Commissariat A L Energie Atomique, Bruyeres-le-chatel (France).
S. Derlich. Aug 69, 21p CEA-R-3762-1
Lang- in French, English Summary

Descriptors: *Nuclear explosions, *Rocks, *Underground explosions, Crack propagation, Drilling, High temperature, Mechanical engineering, Sampling, Stratigraphy.

For abstract, see STAR 07 24.
N69-40468 HC$3.00 MF$0.65

GROUND HEATING DUE TO A POINT SOURCE OF 122- TO 15-MeV NEUTRONS AT AN ALTITUDE OF 50 FEET,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18F.
For abstract, see NSA 23 23.
ORNL-TM-2587 HC$3.00 MF$0.65

CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE): PROGRESS REPORT FOR APRIL 1 TO JUNE 30, 1969,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 8I.
For abstract, see NSA 23 23.
ORNL-TM-2689 HC$3.00 MF$0.65

QUESTIONS AND ANSWERS TO THE COLORADO COMMITTEE FOR ENVIRONMENTAL INFORMATION.
Nevada Operations Office (AEC), Las Vegas.
1969, 80P

Descriptors: (*Nuclear explosions, *Radiological contamination), (*Petroleum, Recovery), Underground explosions, Tritium.
Identifiers: Gasbuggy shot, Reservoir engineering.

For abstract, see NSA 23 23.
PNE-G-48 HC$3.00 MF$0.65

PRESHOT GEOPHYSICAL STUDIES OF CABRIOLET NUCLEAR CRATER SITE,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 8G.
For abstract, see NSA 23 23.
PNE-953 HC$3.00 MF$0.65

CABRIOLET: SPECIAL CLOUD CONTENT STUDIES,
California Univ., Livermore. Lawrence Radiation Lab.
J. J. Cohen. Jun 68, 20p UCRL-50452

Descriptors: (*Nuclear explosions, Radiological contamination), Clouds, Sampling.
Identifiers: Cabriolet shot.

For abstract, see NSA 23 23.
PNE-955 HC$3.00 MF$0.65

THE NUCLEAR EXPLOSIVE, A POTENTIAL ASSET TO CHEMICAL INDUSTRY (L'Explosif Nucleaire Atout Potentiel pour l'Industrie Chimique),
California Univ., Livermore. Lawrence Radiation Lab.
P. Cohen, M. Dupuis, and S. M. Picq. Jul 69, 13p
Trans. of Energie Nucleaire (France) v10 n3 p224-230 May 68.

Descriptors: (*Nuclear explosions, Gases), (*Underground explosions, Nuclear explosions), Chemical industry, Radiation chemistry, Granite, Chemical reactions, France.

For abstract, see NSA 23 23.
UCRL-Trans-10372 HC$3.00 MF$0.65

RECORDS OF SELECTED WELLS AND SPRINGS IN THE RULISON PROJECT AREA, GARFIELD AND MESA COUNTIES, COLORADO,
Geological Survey, Denver, Colo.
For primary bibliographic entry see Field 8H.
For abstract, see NSA 23 23.
USGS-474-40 HC$3.00 MF$0.65

18D. Nuclear Instrumentation

PROGRESS REPORT PROBLEM H01-32 - AIRBORNE RADIAC 1 JANUARY 1969 - 30 JUNE 1969.
Memorandum rept.,
Naval Research Lab Washington D C
Charles W. Peters. Oct 69, 23p Rept no. NRL-MR-2056
See also AD-691 204.

Descriptors: (*Nuclear explosions, Radioactive fallout), (*Gamma counters, Airborne), Gamma rays, Scintillation counters, Altitude, Dose rate.

The report covers the preliminary design of an airborne radiation detector for use in an Airborne Radiac - Flyable Breadboard to measure the ground level dose rate over a fallout field after the fallout cloud has passed. Detailed computer calculations support the gamma ray spectral intensity versus altitude characteristics estimated in the previous progress report. (Author)
AD-697 921 HC$3.00 MF$0.65

THE DEVELOPMENT OF A PHOTOTROPIC ANODIZED ALUMINUM FINISH RESPONSIVE TO GAMMA RADIATION.
North Star Research and Development Inst Minneapolis Minn
For primary bibliographic entry see Field 7E.
AD-698 037 HC$3.00 MF$0.65

THICKNESS CORRECTIONS FOR NEUTRON-ACTIVATED GOLD FOILS.
Master's Thesis,
Argonne National Lab., Ill.
George S. Stanford, and James H. Seckinger. Feb 69, 78p
Contract W-31-109-eng-38

Descriptors: (*Neutron activation, *Gold), (*Neutron counters, Foils), Power reactors, Calibration, Mathematical prediction, Curve fitting, Computer programs, Theses.
Identifiers: STANSECO computer program.

For abstract, see NSA 23 23.
ANL-7545 HC$3.00 MF$0.65

INTERCALIBRATION OF COUNTING LABORATORIES,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
J. A. Uhseth. Aug 69, 8p
Contract AT (45-1)-1830

Descriptors: (*Neutron counters, Calibration), Nuclear physics laboratories, Neutron activation, Radioactive isotopes.

For abstract, see NSA 23 23.
BNWL-1096 HC$3.00 MF$0.65

FORMATION OF PARTICLE TRACKS.
Nebraska Univ., Lincoln. Behlen Lab. of Physics.
24 Feb 69, 19p CONF-690522-4
Presented at the International Meeting on the Study of Charged Particle Tracks in Solid Insulators and Their Applications, Clermont-Ferrand (France), 6-9 May 69.

Descriptors: (*Charged particles, *Ionization trails), Radiation damage, Particle trajectories, Radiation measurement systems.

For abstract, see NSA 23 23.
COO-1671-18 HC$3.00 MF$0.65

NEW NEUTRON DOSIMETER AND NEUTRON-SPECTRUM MODEL FOR NUCLEAR ACCIDENT DOSIMETRY,
Oak Ridge Gaseous Diffusion Plant, Tenn.
J. C. Bailey. 2 Oct 69, 67p*
Contract W-7405-eng-26

Descriptors: (*Dosimeters, Neutron detectors), Neutron flux, Neutron spectrum, Reactor accidents, Radiological dosage.

For abstract, see NSA 23 23.
K-1763 HC$3.00 MF$0.65

PLUTONIUM 236 TRACE DETERMINATION IN PLUTONIUM 238 BY ALPHA SPECTROMETRY.
Dosage de Traces de Plutonium 236 Dans le Plutonium 238 Par Spectrometrie Alpha
Commissariat A L Energie Atomique, Fontenay-Aux-roses (France). Centre D Etudes Nucleaires.
M. L. Acena, R. Berger, and R. Pottier. Jul 69, 37p CEA-R-3773
Lang- in French, English Summary

Descriptors: *Alpha particles, *Nuclear radiation spectroscopy, *Plutonium isotopes, *Semiconductor devices, Pulse amplitude, Radiation dosage, Radioactive decay, Spectroscopic analysis, Trace elements.

For abstract, see STAR 07 24.
N69-40217 HC$3.00 MF$0.65

GAMMA RADIATION FROM FISSION FRAGMENTS. EXPERIMENTAL APPARATUS - MASS SPECTRUM RESOLUTION.
Aktiebolaget Atomenergi, Studsvik (Sweden). Neutron Physics Lab.
J. Higbie. Aug 69, 52p AE-367

Descriptors: *Experimental design, *Fission products, *Gamma rays, *Mass spectra, Circuit diagrams, Energy dissipation, Neutron decay, Nuclear fission, Photomultiplier tubes, Radiation detectors, Thermal neutrons.

For abstract, see STAR 07 24.
N69-40559 HC$3.00 MF$0.65

NOTE CONCERNING THE USE OF SILICON PHOTO-DIODES IN A SCINTILLATOR DETECTOR.
Mise Au Point Concernant l'Utilisation de Photodiodes Au Silicium Dans Un Detecteur A Scintillation
Commissariat A L Energie Atomique, Saclay (France). Centre D'etudes Nucleaires.
R. Verdant. Aug 69, 37p CEA-BIB-169
Lang- in French, English Summary

Descriptors: *Nuclear particles, *Photodiodes, *Scintillation counters, *Silicon, Barrier layers, Bibliographies, Photoelectric cells, Radiation counters, Solid state devices, Spectrometers.

For abstract, see STAR 07 24.
N69-40730 HC$3.00 MF$0.65

STUDY OF FISSION-FRAGMENT-INDUCED NUCLEATION OF BUBBLES IN SUPERHEATED WATER,
Stanford Univ., Calif. Nuclear Engineering Lab.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 23 23.
SU-326-P-13-4 HC$3.00 MF$0.65

DEVELOPMENT OF A BORON CONCENTRATION METER.
Technical progress rept. for the period ending 30 Jun 68.
Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Dept.
Aug 68, 88p EURAEC-2042
Contract AT (30-1)-3690

Descriptors: (*Neutron absorption, Boron), (*Boron, *Meters), Neutron beams, Neutron counters.

For abstract, see NSA 23 23.

WCAP-3690-6 HC$3.00 MF$0.65

18E. Nuclear Power Plants

MH-1A PROTECTION SYSTEM REVIEW,
NUS Corp Rockville Md
For primary bibliographic entry see Field 18I.
AD-698 038 HC$3.00 MF$0.65

STUDY OF THE CONTROL OF A FAST-REACTOR NUCLEAR POWER PLANT ON A HYBRID COMPUTER (Etude de la Regulation d'Une Centrale Nuclearire a Reacteur Rapide sur Calculateur Hybride),
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 23 23.
ANL-Trans-771 HC$3.00 MF$0.65

HALLAM NUCLEAR POWER FACILITY: HYDRAULIC TEST OF MAIN HEAT TRANSFER SYSTEM.
Post critical test completion rept.
Atomics International, Canoga Park, Calif.
7 Feb 64, 43p AI-PC-510
Contract AT (11-1)-GEN-8
Prepared in cooperation with Consumers Public Power District, Hallam, Nebr.

Descriptors: (*Nuclear power plants, Reactor system components), Nebraska.
Identifiers: Hallam power reactor.

For abstract, see NSA 23 23.
DOCKET-1153-2 HC$3.00 MF$0.65

HALLAM NUCLEAR POWER FACILITY: HEAT TRANSFER TESTS.
Post critical test completion rept.
Atomics International, Canoga Park, Calif.

10 Feb 64, 40p AI-PC-530
Contract AT (11-1)-GEN-8
Prepared in cooperation with Consumers Public Power District, Hallam, Nebr.

Descriptors: (*Nuclear power plants, Reactor system components), Nebraska.
Identifiers: Hallam power reactor.

For abstract, see NSA 23 23.
DOCKET-1153-3 HC$3.00 MF$0.65

INDIAN POINT STATION, UNIT NO. 1. REPORT OF WELD FAILURE IN PRIMARY PIPING.
Consolidated Edison Co. of New York, Inc., New York.

12 Sep 69, 2p

Descriptors: (*Nuclear power plants, Reactor system components), Pipes, Welds, New York.
Identifiers: Indian Point power reactor.

For abstract, see NSA 23 23.
DOCKET-50003-6 HC$3.00 MF$0.65

STRESS ANALYSIS OF REACTOR VESSEL INTERNALS AND SUPPORT SKIRT FOR SUBCOOLED PHASE OF INDIAN POINT UNIT NO. 1 BLOWDOWN.
Consolidated Edison Co. of New York, Inc., New York.

Sep 69, 137p

Descriptors: (*Nuclear power plants, Reactor system components), New York.
Identifiers: Indian Point power reactor.

For abstract, see NSA 23 23.
DOCKET-50003-9 HC$3.00 MF$0.65

DRESDEN NUCLEAR POWER STATION, UNIT 1. REPORT OF STARTUP WITH OFF-GAS VALUE IN OFF POSITION.
Commonwealth Edison Co., Chicago, Ill.

14 Aug 69, 2p

Descriptors: (*Nuclear power plants, Reactor operation), Illinois.
Identifiers: Dresden power reactor.

For abstract, see NSA 23 23.
DOCKET-50010-48 HC$3.00 MF$0.65

DRESDEN NUCLEAR POWER STATION, UNIT. 1.
Control Rod Malfunction rept.
Commonwealth Edison Co., Chicago, Ill.

14 Aug 69, 2p

Descriptors: (*Nuclear power plants, Control rods), Illinois.
Identifiers: Dresden power reactor.

For abstract, see NSA 23 23.
DOCKET-50010-49 HC$3.00 MF$0.65

ENRICO FERMI ATOMIC POWER PLANT, UNIT 1. FAILURE OF CONTAINMENT ISOLATION SYSTEM.
Power Reactor Development Co., Detroit, Mich.

26 Sep 69, 2p

Descriptors: (*Nuclear power plants, Containment), Reactor safety systems, Michigan.
Identifiers: Fermi fast breeder reactor.

For abstract, see NSA 23 23.
DOCKET-50016-25 HC$3.00 MF$0.65

YANKEE NUCLEAR POWER STATION. LICENSE NO. DPR-3: TECHNICAL SPECIFICATIONS, CHANGE NO. 89.
Yankee Atomic Electric Co., Boston, Mass.

15 Sep 69, 2p

Descriptors: (*Nuclear power plants, Specifications), Massachusetts.
Identifiers: Yankee power reactor.

For abstract, see NSA 23 23.
DOCKET-50029-98 HC$3.00 MF$0.65

YANKEE NUCLEAR POWER STATION. LICENSE NO. DPR-3: TECHNICAL SPECIFICATIONS, CHANGE NO. 90.
Yankee Atomic Electric Co., Boston, Mass.

22 Sep 69, 3p

Descriptors: (*Nuclear power plants, Specifications), Massachusetts.
Identifiers: Yankee power reactor.

For abstract, see NSA 23 23.
DOCKET-50029-99 HC$3.00 MF$0.65

SAXTON REACTOR. LICENSE NO. DPR-4: TECHNICAL SPECIFICATIONS, CHANGE NO. 32, AMENDMENT 4.
Saxton Nuclear Experimental Corp., Pa.

Sep 69, 154p

Descriptors: (*Nuclear power plants, Specifications), (*Power reactors, Specifications), Pennsylvania.
Identifiers: Saxton power reactor.

For abstract, see NSA 23 23.
DOCKET-50146-40 HC$3.00 MF$0.65

SAXTON REACTOR. LICENSE NO. DPR-4: AMENDMENT 5 TO TECHNICAL SPECIFICATIONS CHANGE NO. 32.
Saxton Nuclear Experimental Corp., Pa.

19 Sep 69, 80p

Descriptors: (*Nuclear power plants, Specifications), (*Power reactors, Specifications), Pennsylvania.
Identifiers: Saxton power reactor.

For abstract, see NSA 23 23.
DOCKET-50146-41 HC$3.00 MF$0.65

CONNECTICUT YANKEE ATOMIC POWER PLANT.
Operation rept. no. 69-8, Aug 69.
Connecticut Yankee Atomic Power Co., Boston, Mass.

11 Sep 69, 17p NYO-3250-38
Contract AT (30-1)-3250

Descriptors: (*Nuclear power plants, Reactor operation), Connecticut.
Identifiers: Connecticut Yankee power reactor.

For abstract, see NSA 23 23.
DOCKET-50213-18 HC$3.00 MF$0.65

ROBERT EMMETT GINNA NUCLEAR POWER PLANT, UNIT NO. 1.
Addendum to the Safety evaluation.
Rochester Gas and Electric Corp., N.Y.

19 Sep 69, 3p

Descriptors: (*Nuclear power plants, Reactor safety systems), New York.
Identifiers: Robert E. Ginna power reactor.

For abstract, see NSA 23 23.
DOCKET-50244-25 HC$3.00 MF$0.65

MONTICELLO NUCLEAR GENERATING PLANT, UNIT NO. 1.
Facility Description and Safety Analysis rept., Amendment 18.
Northern States Power Co., Minneapolis, Minn.

19 Sep 69, 7p

Descriptors: (*Nuclear power plants, Reactor safety systems), Minnesota.
Identifiers: Monticello power reactor.

For abstract, see NSA 23 23.
DOCKET-50263-26 HC$3.00 MF$0.65

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3.
Final safety analysis rept., Amendment 8.
Duke Power Co., Charlotte, N.C.

15 Sep 69, 199p DOCKET-50270-9, DOCKET-50287-6

Descriptors: (*Nuclear power plants, Reactor safety systems), North Carolina.
Identifiers: Oconee power reactor.

For abstract, see NSA 23 23.
DOCKET-50269-9 HC$3.00 MF$0.65

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2.
Northern States Power Co., Minneapolis, Minn.

25 Jul 69, 274p DOCKET-50305-11
Report on damage caused by fire on 31 Mar 69, and Repair of Fire Damaged Structure.

Descriptors: (*Nuclear power plants, Fires), Minnesota.
Identifiers: Prairie Island power reactor.

For abstract, see NSA 23 23.
DOCKET-50282-11 HC$3.00 MF$0.65

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, RED WING, MINNESOTA, UNITS 1 AND 2. CONSTRUCTION PERMITS NOS. CPPR-45 AND 46: SUPPLEMENTAL INFORMATION.
Northern States Power Co., Minneapolis, Minn.

29 Aug 69, 10p DOCKET-50306-9

Descriptors: (*Nuclear power plants, Reactor safety systems), Minnesota.
Identifiers: Prairie Island power reactor.

For abstract, see NSA 23 23.
DOCKET-50282-9 HC$3.00 MF$0.65

MAINE YANKEE ATOMIC POWER STATION. CONTAINMENT WALL DESIGN.
Maine Yankee Atomic Power Co., Wiscasset.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 23 23.
DOCKET-50309-16 HC$3.00 MF$0.65

DIABLO CANYON, UNIT 2.
Preliminary safety analysis rept., Amendment 6.
Pacific Gas and Electric Co., San Francisco, Calif.

25 Sep 69, 13p

Descriptors: (*Nuclear power plants, Reactor safety systems), California.
Identifiers: Diablo Canyon power reactor.

For abstract, see NSA 23 23.
DOCKET-50323-9 HC$3.00 MF$0.65

SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2.
Preliminary Safety Analysis rept., Amendment 4.
Tennessee Valley Authority, Knoxville.

5 Sep 69, 479p DOCKET-50328-7

Descriptors: (*Nuclear power plants, Reactor safety systems), Tennessee.
Identifiers: Sequoyah power reactor.

For abstract, see NSA 23 23.
DOCKET-50327-7 HC$3.00 MF$0.65

DUANE ARNOLD ENERGY CENTER.
Preliminary Safety Analysis rept., Amendment 4.
Iowa Electric Light and Power Co., Cedar Rapids.

18 Aug 69, 138p

Descriptors: (*Nuclear power plants, Reactor safety systems), Electric power production, Iowa.
Identifiers: Duane Arnold power reactor.

For abstract, see NSA 23 23.
DOCKET-50331-10 HC$3.00 MF$0.65

DUANE ARNOLD ENERGY CENTER.
Preliminary Safety Analysis rept., Amendment 5.
Iowa Electric Light and Power Co., Cedar Rapids.

26 Aug 69, 200p

Descriptors: (*Nuclear power plants, Reactor safety systems), Iowa.
Identifiers: Duane Arnold power reactor.

For abstract, see NSA 23 23.
DOCKET-50331-11 HC$3.00 MF$0.65

GARIGLIANO NUCLEAR POWER PLANT.
Quarterly Operation rept. no. 2 for 1969.
Ente Nazionale per l'Energia Elettrica, Rome (Italy).

30 Jun 69, 17p

Descriptors: (*Nuclear power plants, Reactor operation), Electric power production, Italy.
Identifiers: Garigliano power reactor.

For abstract, see NSA 23 23.
TID-25188 HC$3.00 MF$0.65

GUNDREMMINGEN NUCLEAR POWER PLANT.
Monthly rept. Nov 67.
Kernkraftwerk RWE-Bayernwerk G.m.b.H., Gundremmingen (West Germany).

1967, 50p
Text in German.

Descriptors: (*Nuclear power plants, Reactor operation), West Germany.
Identifiers: Gundremmingen power reactor.

For abstract, see NSA 23 23.
TID-25200 HC$3.00 MF$0.65

GUNDREMMINGEN NUCLEAR POWER PLANT.
Monthly rept. Jan 69.
Kernkraftwerk RWE-Bayernwerk G.m.b.H., Gunremmingen (West Germany).

17 Feb 69, 46p
Text in German.

Descriptors: (*Nuclear power plants, Reactor operation), West Germany.
Identifiers: Gundremmingen power reactor.

For abstract, see NSA 23 23.
TID-25201 HC$3.00 MF$0.65

GUNDREMMINGEN NUCLEAR POWER PLANT.
Monthly rept. Feb 69.
Kernkraftwerk RWE-Bayernwerk G.m.b.H., Gundremmingen (West Germany).

13 Mar 69, 44p
Text in German.

Descriptors: (*Nuclear power plants, Reactor operation), West Germany.
Identifiers: Gundremmingen power reactor.

For abstract, see NSA 23 23.
TID-25202 HC$3.00 MF$0.65

GUNDREMMINGEN NUCLEAR POWER PLANT.
Monthly rept. Mar 69.
Kernkraftwerk RWE-Bayernwerk G.m.b.H., Gundremmingen (West Germany).

1969, 42p
Text in German.

Descriptors: (*Nuclear power plants, Reactor operation), West Germany.
Identifiers: Gundremmingen power reactor.

For abstract, see NSA 23 23.
TID-25203 HC$3.00 MF$0.65

GUNDREMMINGEN NUCLEAR POWER PLANT.
Monthly rept. Apr 69.
Kernkraftwerk RWE-Bayernwerk G.m.b.H., Gundremmingen (West Germany).

19 May 69, 43p
Text in German.

Descriptors: (*Nuclear power plants, Reactor operation), West Germany.
Identifiers: Gundremmingen power reactor.

For abstract, see NSA 23 23.
TID-25204 HC$3.00 MF$0.65

GUNDREMMINGEN NUCLEAR POWER PLANT.
Monthly rept. Jun 69.
Kernkraftwerk RWE-Bayernwerk G.m.b.H., Gundremmingen (West Germany).

16 Jul 69, 42p
Text in German.

Descriptors: (*Nuclear power plants, Reactor operation), West Germany.
Identifiers: Gundremmingen power reactor.

For abstract, see NSA 23 23.
TID-25206 HC$3.00 MF$0.65

18F. Radiation Shielding and Protection

NEUTRON AND SECONDARY GAMMA-RAY TRANSPORT IN INFINITE HOMOGENEOUS AIR.
Oak Ridge National Lab Tenn
E. A. Straker, and M. L. Gritzner. Dec 69, 432p
Rept no. ORNL-4464

Descriptors: (*Nuclear explosions, *Nuclear radiation), (*Neutron transport theory, Air), (*Gamma rays, Transport properties), Thermonuclear reactions, Neutrons, Dose rate, Airburst, Tables.

The detailed energy, angular, and spatial distribution of neutrons and their secondary gamma rays is given for nine source energy groups, a fission spectrum, and a typical thermonuclear spectrum. Results for ranges to 2000 meters for the eleven sources are supplemented with results to 5000 meters for a fission and 12.2- to 15-MeV source. In addition to the detailed description of the radiation field, the angular distributions of Henderson dose, Snyder-Neufeld dose, tissue kerma, mid-phantom dose, concrete kerma, air kerma, ionizing silicon kerma, and non-ionizing silicon kerma are given for neutrons, and the Henderson dose, concrete kerma, air kerma, and silicon kerma are given for secondary gamma rays. Some comparisons with air-over-ground results are made. (Author)
AD-697 901 HC$3.00 MF$0.65

DIFFERENTIAL NEUTRON AND SECONDARY GAMMA-RAY ALBEDOS FOR STEEL-COVERED CONCRETE SLABS: VOLUME I. DESCRIPTION OF CALCULATIONS AND COMPARISONS WITH OTHER DATA.
Radiation Research Associates Inc Fort Worth Tex
M. B. Wells, and J. D. Marshall. 10 Jul 69, 61p
Rept no. RRA-T97-1
See also Volume 2, AD-697 909.

Descriptors: (*Neutron transport theory, Concrete), (*Shielding, *Albedo), Steel, Neutrons, Gamma rays, Ducts.

Calculations were performed with the two-dimensional Sn procedure DOT to determine the distribution in energy and angle of the neutrons and secondary gamma rays reflected from steel-covered concrete slabs for 27 incident neutron energy intervals ranging from 14.918 MeV to 2.53 x 10 to the -8th power MeV and for 5 incident directions. The doubly-differential neutron current albedo was computed for 30 emergent directions and for each of the 27 energy intervals lying between and including the incident energy interval and 2.53 x 10 to the -8th power MeV. The secondary gamma-ray doubly-differential current albedo was computed for the same parameters as those used to define the neutron albedo except that 13 energy intervals between 10.0 MeV and 0.01 MeV were used to define the reflected secondary gamma-ray energy distribution. The neutron and secondary gamma-ray double-differential current albedos were converted to number albedos, dif-

ferential current-and flux-dose albedos, and current-and flux-dose albedos. These data are compared with albedo data reported by other investigators for iron slabs and concrete slabs. (Author)
AD-697 908 HC$3.00 MF$0.65

DIFFERENTIAL NEUTRON AND SECONDARY GAMMA-RAY ALBEDOS FOR STEEL-COVERED CONCRETE SLABS: VOLUME II. NEUTRON DOUBLY DIFFERENTIAL ALBEDOS FOR INCIDENT POLAR ANGLE OF 15.78 DEGREES,
Radiation Research Associates Inc Fort Worth Tex
M. B. Wells, and J. D. Marshall. 10 Jul 69, 90p
Rept no. RRA-T97-2
See also Volume 1, AD-697 908, and Volume 3, AD-697 910.
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Neutron transport theory, Concrete), (*Shielding, *Albedo), Albedo, Steel, Neutrons, Gamma rays, Tables.

The report is one of a 7 volume series presenting calculated neutron and secondary gamma-ray albedo data for concrete slabs covered with a 1-in.-thick steel liner. The albedo calculations were performed with a special version of the two-dimensional S (n) procedure DOT. The volume presents tabulated data giving the DOT-calculated doubly differential number albedos for neutrons. Neutron albedo data are given for a fixed angle of incidence. This volume contains data for a polar angle of incidence of 15.78 deg.
AD-697 909 HC$3.00 MF$0.65

DIFFERENTIAL NEUTRON AND SECONDARY GAMMA-RAY ALBEDOS FOR STEEL-COVERED CONCRETE SLABS: VOLUME III. NEUTRON DOUBLY DIFFERENTIAL ALBEDOS FOR INCIDENT POLAR ANGLE OF 32.98 DEGREES,
Radiation Research Associates Inc Fort Worth Tex
M. B. Wells, and J. D. Marshall. 10 Jul 69, 86p
Rept no. RRA-T97-3
See also Volume 2, AD-697 909, and Volume 4, AD-697 911.
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Neutron transport theory, Concrete), (*Shielding, *Albedo), Steel, Neutrons, Gamma rays, Tables.

The report is one of a 7 volume series presenting calculated neutron and secondary gamma-ray albedo data for concrete slabs covered with a 1-in.-thick steel liner. The albedo calculations were performed with a special version of the two-dimensional Sn procedure DOT. The volume presents tabulated data giving the DOT-calculated double differential number albedos for neutrons. Neutron albedo data are given for a fixed angle of incidence. This volume contains data for a polar angle of incidence of 32.98 deg.
AD-697 910 HC$3.00 MF$0.65

DIFFERENTIAL NEUTRON AND SECONDARY GAMMA-RAY ALBEDOS FOR STEEL-COVERED CONCRETE SLABS: VOLUME IV. NEUTRON DOUBLY DIFFERENTIAL ALBEDOS FOR INCIDENT POLAR ANGLE OF 46.06 DEGREES,
Radiation Research Associates Inc Fort Worth Tex
M. B. Wells, and J. D. Marshall. 10 Jul 69, 88p
Rept no. RRA-T97-4
See also Volume 3, AD-697 910, and Volume 5, AD-697 612.
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Neutron transport theory, Concrete), (*Shielding, *Albedo), Steel, Neutrons, Gamma rays, Tables.

The report is one of a 7 volume series presenting calculated neutron and secondary gamma-ray albedo data for concrete slabs covered with a 1-inch thick steel liner. The albedo calculations were performed with a special version of the two-dimensional Sn procedure DOT. The volume presents tabulated data giving the DOT-calculated doubly differential number albedos for neutrons. Neutron albedo data are given for a fixed angle of incidence. This volume contains data for a polar angle of incidence of 46.06 deg.
AD-697 911 HC$3.00 MF$0.65

DIFFERENTIAL NEUTRON AND SECONDARY GAMMA-RAY ALBEDOS FOR STEEL-COVERED CONCRETE SLABS: VOLUME V. NEUTRON DOUBLY DIFFERENTIAL ALBEDOS FOR INCIDENT POLAR ANGLE OF 59.39 DEGREES,
Radiation Research Associates Inc Fort Worth Tex
M. B. Wells, and J. D. Marshall. 10 Jul 69, 87p
Rept no. RRA-T97-5
See also Volume 4, AD-697 911, and Volume 6, AD-697 913.
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Neutron transport theory, Concrete), (*Shielding, *Albedo), Steel, Neutrons, Gamma rays, Tables.

The report is one of a 7 volume series presenting calculated neutron and secondary gamma-ray albedo data for concrete slabs covered with a 1-in. thick steel liner. The albedo calculations were performed with a special version of the two-dimensional Sn procedure DOT. The volume presents tabulated data giving the DOT-calculated double differential number albedos for neutrons. Neutron albedo data are given for a fixed angle of incidence. This volume contains data for a polar angle of incidence of 59.39 deg.
AD-697 912 HC$3.00 MF$0.65

DIFFERENTIAL NEUTRON AND SECONDARY GAMMA-RAY ALBEDOS FOR STEEL-COVERED CONCRETE SLABS: VOLUME VI. NEUTRON DOUBLY DIFFERENTIAL ALBEDOS FOR INCIDENT POLAR ANGLE OF 78.9 DEGREES,
Radiation Research Associates Inc Fort Worth Tex
M. B. Wells, and J. D. Marshall. 10 Jul 69, 88p
Rept no. RRA-T97-6
See also Volume 5, AD-697 912, and Volume 7, AD-697 914.
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Neutron transport theory, Concrete), (*Shielding, *Albedo), Steel, Neutrons, Gamma rays, Tables.

The report is one of a 7 volume series presenting calculated neutron and secondary gamma-ray albedo data for concrete slabs covered with a 1-in.-thick steel liner. The albedo calculations were performed with a special version of the two-dimensional Sn procedure DOT. Neutron albedo data are given for a fixed angle of incidence. This volume contains data for a polar angle of incidence of 78.9 deg.
AD-697 913 HC$3.00 MF$0.65

DIFFERENTIAL NEUTRON AND SECONDARY GAMMA-RAY ALBEDOS FOR STEEL-COVERED CONCRETE SLABS: VOLUME VII. SECONDARY GAMMA-RAY DIFFERENTIAL NUMBER ALBEDOS DATA,
Radiation Research Associates Inc Fort Worth Tex
M. B. Wells, and J. D. Marshall. 10 Jul 69, 141p
Rept no. RRA-T97-7
See also Volume 6, AD-697 913, and Volume 1, AD-697 908.
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Neutron transport theory, Concrete), (*Gamma rays, Neutron transport theory), (*Shielding, *Albedo), Steel, Neutrons, Tables.

The report is one of a 7 volume series presenting calculated neutron and secondary gamma-ray albedo data for concrete slabs covered with a 1-in.-thick steel liner. The albedo calculations were performed with a special version of the two-dimensional Sn procedure DOT. The volume presents tabulated data giving the DOT-calculated doubly differential number albedos for secondary gamma rays.
AD-697 914 HC$3.00 MF$0.65

MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1.
Final Safety Analysis rept., Amendent 17.
Northern States Power Co., Minneapolis, Minn.
15 Sep 69, 112p

Descriptors: (*Nuclear power plants, Reactor safety systems), Minnesota.
Identifiers: Monticello power reactors.

For abstract, see NSA 23 23.
DOCKET-50263-24 HC$3.00 MF$0.65

IODINE AND NOBLE GAS RETENTION STUDIES.
Progress rept., Oct 66-Dec 68,
Du Pont de Nemours (E. I.) and Co., Aiken, S.C. Savannah River Lab.
Robert C. Milham, and Larry R. Jones. Aug 69, 22p
Contract AT (07-2)-1

Descriptors: (*Iodine, Adsorption), (*Radioactive waste, *Air pollution), Carbon, Radioactive isotopes.
Identifiers: Desorption, Iodine 131, Radiolysis.

For abstract, see NSA 23 23.
DP-1209 HC$3.00 MF$0.65

PROGRAM LCDUCT: TWO-BEND RECTANGULAR DUCT RADIATION LEAKAGE ANALYSIS,
General Electric Co., Cincinnati, Ohio. Nuclear Systems Programs.
W. E. Edwards, and W. B. Henderson. 1968, 48p

Descriptors: (*Neutron scattering, Duct bends), (*Gamma-ray scattering, Duct bends), Dose rate, Fallout shelters, Programming (Computers).
Identifiers: LCDUCT computer program.

For abstract, see NSA 23 23.
GESP-295 HC$3.00 MF$0.65

STRUCTURAL ANALYSIS OF THE BROOKHAVEN NATIONAL LABORATORY PORTABLE CESIUM IRRADIATOR,
Oak Ridge National Lab., Tenn.
J. H. Evans. Sep 69, 56p
Contract W-7405-eng-26

Descriptors: (*Radioactive isotopes, *Containers), (*Irradiated foods, Shielding), Cesium, Structural properties.

For abstract, see NSA 23 23.
ORNL-TM-2293 HC$3.00 MF$0.65

GROUND HEATING DUE TO A POINT SOURCE OF 12.2- TO 15-MeV NEUTRONS AT AN ALTITUDE OF 50 FEET,
Oak Ridge National Lab., Tenn.
E. A. Straker, M. B. Emmett, and C. L. Thompson. 19 Aug 69, 25p

Descriptors: (*Silos, Shielding), (*Soils, Heating), Underground structures, Neutron capture gamma rays, Concrete, Nuclear explosions.

Identifiers: Hardened installations, Ground heating.

For abstract, see NSA 23 23.
ORNL-TM-2587 HC$3.00 MF$0.65

SEMIEMPIRICAL FORMULAS FOR DOUBLE DIFFERENTIAL CROSS SECTIONS OF SECONDARY NUCLEON PRODUCTION IN BOMBARDMENT OF NUCLEI BY NUCLEONS WITH AN ENERGY OF SEVERAL HUNDRED MeV,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 20H.
For abstract, see NSA 23 23.
ORNL-tr-2203 HC$3.00 MF$0.65

SIMPLIFIED METHOD FOR CALCULATING NITROGEN-CAPTURE AND FISSION-PRODUCT GAMMA-RAY DOSES INSIDE UNDERGROUND CONCRETE STRUCTURES,
Radiation Research Associates, Inc., Fort Worth, Tex.
J. D. Marshall, and M. B. Wells. 21 Apr 69, 31p
CONF-670602-32
Revision of report dated 11 Jun 67. Presented at the Annual Meeting of the American Nuclear Society (13th), San Diego, Calif. 11-15 Jun 67.

Descriptors: (*Fallout shelters, Fission product activity), (*Gamma rays, *Radiological dosage), Neutron capture gamma rays, Shielding, Concrete, Underground structures, Numerical analysis.

For abstract, see NSA 23 23.
RRA-M-71-A-Rev HC$3.00 MF$0.65

18G. Radioactive Wastes and Fission Products

CONTINUOUS INCINERATION OF PLUTONIUM-BEARING SCRAP,
Atlantic Richfield Hanford Co., Richland, Wash.
Lee M. Knights. 15 Sep 69, 12p SM-125/62,
CONF-691008-1
Presented at the Symposium on Radiation Safety Problems in the Design and Operation of Hot Facilities, Sacley, (France).

Descriptors: (*Radioactive waste, Disposal), (*Incinerators, Radioactive waste), Plutonium.

For abstract, see NSA 23 23.
ARH-SA-39 HC$3.00 MF$0.65

TREATMENT OF HANFORD NUCLEAR FUELS PROCESSING WASTES TO PERMIT LONG-TERM STORAGE,
Atlantic Richfield Hanford Co., Richland, Wash.
D. E. Larson, and P. W. Smith. 4 Aug 69, 20p
CONF-690819-1
Contract AT (45-1)-2130
Presented at the National Meeting of the American Institute of Chemical Engineers, (66th), Portland, Oreg. 24-27 Aug 69. PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Radioactive waste, *Storage), (*Reactor fuel processing, Radioactive waste), Cesium, Strontium.

For abstract, see NSA 23 23.
ARH-SA-51 HC$3.00 MF$0.65

BEHAVIOR OF 133Xe GAS AFTER INJECTION UNDERGROUND: MOLECULAR DIFFUSION MATERIALS BALANCE BAROMETRIC PRESSURE EFFECTS,
Geological Survey, Idaho Falls, Idaho. Water Resources Div.
J. B. Robertson. Jul 69, 37p

Descriptors: (*Radioactive waste, Underground), (*Xenon, Diffusion), Rock (Geology), Permeability, Disposal, Barometric pressure, Mathematical models.

For abstract, see NSA 23 23.
IDO-22051 HC$3.00 MF$0.65

DEVELOPMENT OF IN-BED COMBUSTION HEATING FOR CALCINATION OF RADIOACTIVE WASTES,
Idaho Nuclear Corp., Idaho Falls.
T. K. Thompson. Jul 69, 25p
Contract AT (10-1)-1230

Descriptors: (*Radioactive waste, Disposal), Heating, Combustion.
Identifiers: Calcination, Roasting.

For abstract, see NSA 23 23.
IN-1278 HC$3.00 MF$0.65

USE OF A THIN-FILM EVAPORATOR FOR BITUMEN COATING OF RADIOACTIVE CONCENTRATES.
Utilisation D'un Evaporateur A Couche Mince pour l'Enrobage Par le Bitume de Concentrats Radioactifs
Commissariat A L Energie Atomique, Chusclan (France). Centre de Production de Plutonium.
Y. Cudel, R. Hullo, G. Lefillatre, L. Rodi, and J. Rodier. Jul 69, 32p CEA-R-3742
Lang- in French, English Summary

Descriptors: *Concentrating, *Evaporators, *Pilot plants, *Thin films, Bitumens, Decontamination, Precipitation (chemistry), Protective coatings, Radioactive wastes.

For abstract, see STAR 07 24.
N69-40574 HC$3.00 MF$0.65

BIBLIOGRAPHIC DISCUSSION ON THE PHYSICO-CHEMICAL BEHAVIOUR AND THE RADIO-ECOLOGY OF ZIRCONIUM IN HYDROBIOLOGICAL SYSTEMS.
Discussion Bibliographique Sur le Comportement Physico-chimique Et La Radioecologie Du Zirconium Dans les Systemes Hydrobiologiques
Commissariat A L Energie Atomique, Fontenay-Aux-roses (France). Centre D'etudes Nucleaires.
R. Bittel. Jul 69, 58p CEA-BIB-159, EUR-4129-F
Contracts EURATOM-003-63-10-PSAF, CEA-4112-R
Lang- in French, English Summary

Descriptors: *Biological effects, *Nuclides, *Radioactive isotopes, Analytical chemistry, Bibliographies, Fission products, Radioactive debris, Reaction kinetics, Trace contaminants, Zirconium compounds.

For abstract, see STAR 07 24.
N69-40589 HC$3.00 MF$0.65

THE SAFE MANAGEMENT OF RADIOACTIVE WASTES,
Atlantic Richfield Hanford Co., Richland, Wash.
R. W. Harvey. Nov 69, 13p ARH-SA-52

Descriptors: (*Radioactive waste, Storage), Tanks (Containers), Reactor fuel processing, Safety.

Described is the safe management of radioactive wastes at the fuel reprocessing plants at the Hanford Plant.
PB-188 137 HC$3.00 MF$0.65

18H. Radioactivity

FACTS ON RADIATION AND FALLOUT. AN APPENDIX TO THE PROTOTYPE MANUAL ON CIVIL DEFENSE ASPECTS OF WATER-WORKS OPERATION.
Engineering-Science, Inc., Arcadia, Calif.
For primary bibliographic entry see Field 15C.
AD-445 514 HC$3.00

PROGRESS REPORT PROBLEM H01-32 - AIRBORNE RADIAC 1 JANUARY 1969 - 30 JUNE 1969.
Naval Research Lab Washington D C
For primary bibliographic entry see Field 18D.
AD-697 921 HC$3.00 MF$0.65

ENVIRONMENTAL EFFECTS ON INTERNAL CONVERSION RATES,
Brookhaven National Lab., Upton, N.Y.
For primary bibliographic entry see Field 20H.
For abstract, see NSA 23 23.
BNL-13921 HC$3.00 MF$0.65

DOSE-DEPTH DISTRIBUTIONS PRODUCED BY ELECTRONS IN MULTILAYER TARGETS,
Maryland Univ., College Park. Lab. for Radiation and Polymer Science.
For primary bibliographic entry see Field 13H.
For abstract, see NSA 23 23.
CONF-690805-3 HC$3.00 MF$0.65

FALLOUT PROGRAM QUARTERLY SUMMARY REPORT, JUNE 1, 1969-SEPTEMBER 1, 1969,
New York Operations Office (AEC), N.Y. Health and Safety Lab.
Edward P. Hardy, Jr., and Joseph Rivera. 1 Oct 69, 160p
See also HASL-210.

Descriptors: (*Radioactive fallout, Reports), Radiological contamination, Air pollution, Food, Radioactive isotopes, Strontium, Health physics, Sampling.

For abstract, see NSA 23 23.
HASL-214 HC$3.00 MF$0.65

FALLOUT PROGRAM QUARTERLY SUMMARY REPORT, JUNE 1, 1969-SEPTEMER 1, 1969.
New York Operations Office (AEC), N.Y. Health and Safety Lab.
1 Oct 69, 392p
See also HASL-214, and HASL-210.

Descriptors: (*Radioactive fallout, Reports), Radiological contamination, Radioactive isotopes, Food, Air pollution, Strontium, Health physics, Sampling.

For abstract, see NSA 23 23.
HASL-214-APP. HC$3.00 MF$0.65

THE EFFECTS OF NEUTRON IRRADIATION UPON THE STRENGTH AND DUCTILITY OF VANADIUM,
Ames Lab., Iowa.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 23 23.
IS-2127 HC$3.00 MF$0.65

GROUND HEATING DUE TO A POINT SOURCE OF 12.2- TO 15-MeV NEUTRONS AT AN ALTITUDE OF 50 FEET,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18F.
For abstract, see NSA 23 23.
ORNL-TM-2587 HC$3.00 MF$0.65

CALCULATION OF THE RADIATION DOSE IN THE INTERIOR OF A SATELLITE WITH CONSIDERATION OF THE STRUCTURE OF THE SATELLITE AND THE ANGULAR DISTRIBUTION OF THE RADIATION,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 22B.
For abstract, see NSA 23 23.
ORNL-tr-2201 HC$3.00 MF$0.65

AIR POLLUTION ASPECTS OF RADIOACTIVE SUBSTANCES.
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
For primary bibliographic entry see Field 13B.
PB-188 092 HC$3.00 MF$0.65

PLOTR: A TWO-DIMENSIONAL CONTOURING AND AREA-CALCULATING ROUTINE.
Research rept.,
Sandia Labs., Albuquerque, N. Mex.
Susan M. Milly. Oct 69, 38p SC-RR-69-685

Descriptors: (*Aerosols, Diffusion), (*Radiological contamination, Mathematical prediction), Radioactive fallout, Subroutines.
Identifiers: PLOTR subroutine, XYGRD subroutine.

The report describes the method and use of PLOTR and the auxiliary routine XYGRD; these computer programs contour a function defined over a two-dimensional grid and compute the area within the contour. Sample problems illustrate the use of these routines. (Author)
PB-188 100 HC$3.00 MF$0.65

BIBLIOGRAPHIES OF ATOMIC ENERGY LITERATURE. ISSUED OR IN PROGRESS DURING THE PERIOD JULY-AUGUST 1969.
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
For primary bibliographic entry see Field 5B.
For abstract, see NSA 23 23.
TID-3754 HC$3.00 MF$0.65

STUDIES ON FALLOUT PARTICLES. VII,
California Univ., Berkeley. Lawrence Radiation Lab.
Tetsuo Mamuro, and Tadao Matsunami. May 69, 20p
Trans. of Nihon Genshiryoku Gakkaishi (Japan) v8 n8 p416-423 1966, by T. Sakuragi.

Descriptors: (*Radioactive fallout, Sampling), Radioactive isotopes, Alpha particles, Gamma rays, Nuclear explosions, Japan.
Identifiers: Translations.

For abstract, see NSA 23 23.
UCRL-Trans-10355 HC$3.00 MF$0.65

FISSION GAS RELEASE CURVES: GROWTH AND DECAY FROM FISSION OF 239Pu BY FISSION SPECTRUM NEUTRONS,
California Univ., Livermore. Lawrence Radiation Lab.
D. C. Barg, and W. C. King. May 69, 516p

Descriptors: (*Nuclear explosions, *Fission products), Gases, Plutonium.

For abstract, see NSA 23 23.
UCRL-50656 HC$3.00 MF$0.65

18I. Reactor Engineering and Operation

MH-1A PROTECTION SYSTEM REVIEW,
NUS Corp Rockville Md
John T. Stone, George C. Rudy, Charles A. Negin, and Urs Born. Nov 69, 256p Rept no. NUS-616
Contract DAAK02-69-C-0708

Descriptors: (*Nuclear power plants, *Reactor safety systems), Protection, Power reactors, Reactor accidents, Reliability, Probability, Control rods, Neutron detectors, Electronic equipment.
Identifiers: MH-1A power reactor.

The purpose of the MH-1A protection system review was to compare and evaluate the protection system design against proposed IEEE standards for protection system design and against other current design techniques. An accident analysis was performed that determined that the source range rod withdrawal accident (SRRWA) would result in core damage if the power range scram were to fail during the accident. A reliability analysis of the protection system provided protection system reliabilities for the present protection system with the present test frequencies and for an improved test program. Suggested protection system modifications included additions of -14 volt dc power supplies so that the transistor switches driving the scram control relays would be independent of one another. Also, additional testing switches and test indications are recommended for the process protection channels and the scram control relays. (Author)
AD-698 038 HC$3.00 MF$0.65

OPERATION OF THE SYSTEMS QUALITY SODIUM LOOP.
Interim rept.,
Atomics International, Canoga Park, Calif.
E. W. Murbach, and N. W. Heath. 20 Aug 69, 17p
Contract AT (04-3)-701

Descriptors: (*Liquid metal cooled reactors, *Reactor fuel cladding), Breeder reactors, Fast reactors, Sodium.
Identifiers: Light metal fast breeder reactor.

For abstract, see NSA 23 23.
AI-AEC-12801 HC$3.00 MF$0.65

HIGH HEAT FLUX HEATER DEVELOPMENT. STATUS REPORT II,
Atomics International, Canoga Park, Calif.
E. L. Babbe, J. H. Shively, and M. W. Mahoney. 15 Jul 69, 35p
Contract AT (04-3)-701

Descriptors: (*Reactor coolants, *Heating elements), Sodium, Reactor fuel cladding.

For abstract, see NSA 23 23.
AI-AEC-12813 HC$3.00 MF$0.65

STUDY OF THE CONTROL OF A FAST-REACTOR NUCLEAR POWER PLANT ON A HYBRID COMPUTER (Etude de la Regulation d'Une Centrale Nuclearire a Reacteur Rapide sur Calculateur Hybride),
Argonne National Lab., Ill.
C. Chamboredon, M. Hery, and B. Marion. Sep 69, 14p CONF-670835-2
Trans. of International Congress of AICA (5th) Lausanne, 1967, n.p., 1968 v2 p1065-1070.

Descriptors: (*Nuclear power plants, Fast reactors), (*Reactor control, Mathematical models), Power reactors, Simulation, Analog-digital computers, France.
Identifiers: Hybrid simulation, Translations.

For abstract, see NSA 23 23.
ANL-Trans-771 HC$3.00 MF$0.65

REACTOR PHYSICS DIVISION ANNUAL REPORT, JULY 1, 1967 - JUNE 30, 1968.
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18K.
For abstract, see NSA 23 23.
ANL-7410 HC$3.00 MF$0.65

STUDY OF TRANSIENT HEAT TRANSFER FROM A WATER-IMMERSED ALUMINUM FUEL-PLATE SAMPLE IN TREAT,
Argonne National Lab., Ill.
Lawrence J. Harrison. Apr 69, 41p
Contract W-31-109-eng-38

Descriptors: (*Reactor fuel elements, Heat transfer), Reactor accidents, Transients.
Identifiers: Reactor safety experiments.

For abstract, see NSA 23 23.
ANL-7563 HC$3.00 MF$0.65

1000-MWe LMFBR FOLLOW-ON STUDY.
Control study,
Babcock and Wilcox Co., Lynchburg, Va. Power Generation Div.
J. R. Burris, and R. J. Trost. Oct 68, 156p
Sponsored by Argonne National Lab., Ill.

Descriptors: (*Breeder reactors, *Reactor control), Liquid metal cooled reactors, Fast reactors.
Identifiers: *Liquid metal fast breeder reactors.

For abstract, see NSA 23 23.
BAW-1330 HC$3.00 MF$0.65

FAST FLUX TEST FACILITY QUARTERLY TECHNICAL REPORT MARCH-MAY 1969,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
E. R. Astley. Jul 69, 198p
Contract AT (45-1)-1830

Descriptors: (*Test reactors, *Fast reactors), Test facilities, Fast neutrons.
Identifiers: Fast Flux Test Facility.

For abstract, see NSA 23 23.
BNWL-1090 HC$3.00 MF$0.65

EFFECT OF STRAIN RATE ON MECHANICAL PROPERTIES OF AUSTENITIC STAINLESS STEELS,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 23 23.
BNWL-1105 HC$3.00 MF$0.65

OPTIMUM SPATIAL FLUX CONTROL PROJECT: PHASE I. CEXE: A THREE-DIMENSIONAL NODAL METHOD FOR ANALYSIS OF XENON OSCILLATIONS AND CONTROL,
Combustion Engineering, Inc., Windsor, Conn. Nuclear Power Dept.
Richard Kern, David C. Wright, W. Carlton Coppersmith, and Zoltan R. Rosztoczy. 31 May 69, 132p
Contract AT (30-1)-3932
See also Rep. on Phase 2, CEND-3932-2.

Descriptors: (*Power reactors, Reactor control), (*Reactor control, *Xenon), Heavy water reactors, Reactor power density, Reactor kinetics, Programming (Computers).

For abstract, see NSA 23 23.
CEND-3932-1 HC$3.00 MF$0.65

OPTIMUM SPATIAL FLUX CONTROL PROJECT: PHASE II. XENON OSCILLATION STUDIES FOR THE PICKERING REACTOR,
Combustion Engineering, Inc., Windsor, Conn. Nuclear Power Dept.
Richard Kern, Marion Bonaca, Zoltan R. Rosztoczy, and W. Carlton Coppersmith. 31 May 69, 72p
Contract AT (30-1)-3932
See also Rep. on Phase 1, CEND-3932-1.

Descriptors: (*Power reactors, Reactor control), (*Reactor control, *Xenon), Heavy water reactors, Reactor power density, Reactor kinetics, Programming (Computers).
Identifiers: Pickering power reactor.

For abstract, see NSA 23 23.
CEND-3932-2 HC$3.00 MF$0.65

MAINE YANKEE ATOMIC POWER STATION. CONTAINMENT WALL DESIGN.
Maine Yankee Atomic Power Co., Wiscasset.

26 Sep 69, 3p

Descriptors: (*Nuclear power plants, *Containment), Maine.
Identifiers: Maine Yankee power reactor.

For abstract, see NSA 23 23.
DOCKET-50309-16 HC$3.00 MF$0.65

DUANE ARNOLD ENERGY CENTER.
Iowa Electric Light and Power Co., Cedar Rapids.
For primary bibliographic entry see Field 18E.
For abstract, see NSA 23 23.
DOCKET-50331-10 HC$3.00 MF$0.65

MEASURED ENERGY DEPOSITION RATES FOR VARIOUS NONFISSIONABLE MATERIALS IN A NUCLEAR REACTOR ENVIRONMENT,
Douglas United Nuclear, Inc., Richland, Wash.
Paul J. Zimmerman. 20 Aug 69, 16p CONF-690910-3
Contract AT (45-1)-1857
Presented at the Symposium on Developments in Irradiation Testing Technology, Sandusky, Ohio. Sep 69.

Descriptors: (*Reactor materials, Heating), Calorimeters.

For abstract, see NSA 23 23.
DUN-SA-107 HC$3.00 MF$0.65

SCANAL: A SINGLE CHANNEL SYNTHESIS DEPLETION CODE WITH TRIANGULAR MESH IN THE HORIZONTAL PLANE,
Gulf General Atomic, Inc., San Diego, Calif.
For primary bibliographic entry see Field 18K.
For abstract, see NSA 23 23.
GA-9423 HC$3.00 MF$0.65

GAS-COOLED FAST BREEDER REACTOR.
Quarterly Progress rept. for the period 1 May-31 July 69.
Gulf General Atomic, Inc., San Diego, Calif.
30 Aug 69, 121p
Contract AT (04-3)-167

Descriptors: (*Gas-cooled reactors, *Breeder reactors), Fast reactors, Reactor materials.
Identifiers: Gas cooled fast breeder reactors.

For abstract, see NSA 23 23.
GA-9639 HC$3.00 MF$0.65

REFABRICATION COSTS FOR HTGR FUEL ELEMENT COMPONENTS,
Gulf General Atomic, Inc., San Diego, Calif.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
GAMD-9367 HC$3.00 MF$0.65

CALCULATIONAL MODELING EFFECTS ON FAST BREEDER FUEL CYCLE ANALYSIS.
Los Alamos Scientific Lab., N. Mex.

Apr 69, 16p
Contract W-7405-eng-36

Descriptors: (*Breeder reactors, *Reactor fuels), (*Fast reactors, Reactor fuels), Mathem atical models, Costs.

For abstract, see NSA 23 23.
LA-4187 HC$3.00 MF$0.65

REFERENCE CORE DESIGN FOR THE CONNECTICUT YANKEE ATOMIC POWER COMPANY HADDAM CONNECTICUT REACTOR,
Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Dept.
I. H. Coen. Apr 67, 77p WCAP-2906
Contract AT (30-1)-3250

Descriptors: (*Pressurized water reactors, *Reactor cores), Connecticut.
Identifiers: Connecticut Yankee power reactor.

For abstract, see NSA 23 23.
NYO-3250-39 HC$3.00 MF$0.65

PHASE I. NEW PROTECTIVE SYSTEM DESIGN TECHNIQUES FOR APPLICATION IN NUCLEAR REACTOR PLANTS. VOLUME II,
Pennsylvania State Univ., University Park. Dept. of Nuclear Engineering.
For primary bibliographic entry see Field 14D.
For abstract, see NSA 23 23.
NYO-3986-1-Vol. 2 HC$3.00 MF$0.65

CHARACTERISTICS OF A 2.17-MEGAWATT FAST- SPECTRUM REACTOR CONCEPT USING AN AXIALLY MOVING REFLECTOR CONTROL SYSTEM.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
H. W. Allen, W. Mayo, J. V. Miller, and C. L. Whitmarsh, Jr.. Oct 69, 28p NASA-TM-X-1911
Contract 120-27

Descriptors: *Fast nuclear reactors, *Performance prediction, *Reflectors, *Refractory metals, Axes of rotation, Cladding, Nuclear fuel elements, Reactor cores.

For abstract, see STAR 07 24.
N69-40061 HC$3.00 MF$0.65

STUDY OF THE THERMAL AND HYDRAULIC PHENOMENA OCCURRING DURING POWER EXCURSION ON A HEATED TEST SECTION.
Etude des Phenomenes Thermiques Et Hydrauliques Accompagnant Une Excursion Rapide de Puissance Sur Un Canal Chauffant
Commissariat A L Energie Atomique, Grenoble (France). Centre D Etudes Nucleaires.
M. Nyer. Jun 69, 157p CEA-R-3497
Lang- in French, English Summary

Descriptors: *Hydrodynamics, *Nuclear reactors, *Reactor cores, *Thermal diffusion, Experimental design, Neutron flux density, Pressure measurements, Temperature control, Temperature measurement, Transient pressures.

For abstract, see STAR 07 24.
N69-40471 HC$3.00 MF$0.65

INHERENT NEUTRON SOURCE IN MSRE WITH CLEAN 233U FUEL,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18K.
For abstract, see NSA 23 23.
ORNL-TM-2685 HC$3.00 MF$0.65

STUDIES OF EVALUATION ERRORS OCCURING IN ROD-DROP EXPERIMENTS,
Oak Ridge National Lab., Tenn.
G. Koehler. 1969, 13p
Trans. of Kernenergie (East Germany) v10 n11 p331-336 1967, by R. Gregg Mansfield.

Descriptors: (*Reactor control, Neutron flux), Control rods, East Germany.

For abstract, see NSA 23 23.
ORNL-tr-2221 HC$3.00 MF$0.65

RESEARCH CONCERNING IONIC AND FREE RADICAL REACTIONS IN RADIATION CHEMISTRY.
Tennessee Univ., Knoxville. Dept. of Chemistry.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 23 23.
ORO-2968-49 HC$3.00 MF$0.65

DEVELOPMENT PROGRAM ON THE APPLICATION OF STEAM--WATER SPRAY TO REACTOR COOLING.
Final rept. 15 Dec 61-31 Aug 64.
Centro Informazioni Studi Esperienze, Milan (Italy).
Oct 64, 55p CISE-R-136

Descriptors: (*Reactor coolants, *Steam), Water, Sprays, Heat transfer, Corrosion, Italy.

The CAN-3 research programme concerned a development work linked with features of a possible reactor design and with reactor conditions more closely than had been previous CAN-1 and CAN-2 programs. Experimental work was mainly devoted to the field of heat transfer, hydrodynamics and in-pile experiments for corrosion of structural materials and for water chemistry. The report collects fundamental aspects and results of work done in these fields. (Author)
PB-188 153 HC$3.00 MF$0.65

SOLID MECHANICS WITH APPLICATIONS TO PRESSURIZED WATER REACTORS,
Bettis Atomic Power Lab., Pittsburgh, Pa.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
WAPD-TM-762 HC$3.00 MF$0.65

AGGLOMERATION OF PARTICLES IN TURBULENT FLOW,
Bettis Atomic Power Lab., Pittsburgh, Pa.
S. K. Beal. Sep 69, 21p
Contract AT (11-1)-GEN-14

Descriptors: (*Reactor coolants, Particles), (*Turbulence, Particles), Coagulation, Particle size.

For abstract, see NSA 23 23.
WAPD-TM-904 HC$3.00 MF$0.65

18J. Reactor Materials

CORROSION OF VANADIUM AND VANADIUM-BASE ALLOYS IN SODIUM,
Argonne National Lab., Ill.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 23 23.
ANL-7505 HC$3.00 MF$0.65

FAST-NEUTRON CROSS SECTIONS OF HAFNIUM, GADOLINIUM, AND SAMARIUM,
Argonne National Lab., Ill.
G. L. Sherwood, A. B. Smith, and J. F. Whalen.
May 69, 71p
Contract W-31-109-eng-38

Descriptors: (*Reactor materials, *Neutron cross sections), Fast neutrons, Hafnium, Gadolinium, Samarium.

For abstract, see NSA 23 23.
ANL-7567 HC$3.00 MF$0.65

THE DOPPLER COEFFICIENT OF 238U NEUTRON RESONANCES AND OF THE PWR FUEL CELL,
Brookhaven National Lab., Upton, N.Y.
S. N. Purohit. Jul 69, 35p BNL-T-540

Descriptors: (*Pressurized water reactors, Reactor fuel rods), (*Uranium compounds, *Resonance absorption), Doppler effect, Resonance scattering, Neutron cross sections, Reactor reactivity, Power reactors, Dioxides.
Identifiers: Uranium oxides.

For abstract, see NSA 23 23.
BNL-50185 HC$3.00 MF$0.65

HIGH-TEMPERATURE LIQUID-METAL TECHNOLOGY REVIEW.
Bimonthly technical progress review, vol. 7, no. 3.
Brookhaven National Lab., Upton, N.Y.

Jun 69, 17p
Available on subscription $15.00/year.

Descriptors: (*Liquid metals, Reviews), High-temperature research, Sodium.

For abstract, see NSA 23 23.
BNL-50190 HC$3.00 MF$0.65

ION EXCHANGE: A GENERIC NUCLEAR INDUSTRY PROCESS FOR THE RECOVERY AND FINAL PURIFICATION OF Am, Cm, Pm, Sr, Pu, Np, Cs, Tc, Rh, and Pd,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
E. J. Wheelwright. Oct 68, 19p CONF-690712-1
Contract AT (45-1)-1830
Presented at International Conference on Ion Exchange in the Process Industries, London, (England), 16-18 Jul 69.

Descriptors: (*Reactor fuel processing, *Ion exchange), (*Actinide series, Ion exchange), Purification, Americium, Curium, Promethium, Plutonium, Neptunium, Technetium, Rhodium, Palladium.

For abstract, see NSA 23 23.
BNWL-SA-1945 HC$3.00 MF$0.65

HIGHLY ENRICHED U-Al, 095 WT PERCENT ENRICHED URANIUM, AND Li-Al TARGET SUPER-CELL: PCTR EXPERIMENTS,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
Darrell F. Newman, and Mitsui Hidehiko. Jul 69, 94p
Contract AT (45-1)-1830

Descriptors: (*Reactor fuels, Reactor lattice parameters), Uranium, Aluminum.

For abstract, see NSA 23 23.
BNWL-1029 HC$3.00 MF$0.65

A MASS SPECTROMETRIC-THERMOGRAVIMETRIC TECHNIQUE FOR EVALUATING THE GAS RELEASE POTENTIAL OF SINTERED THORIA,
Du Pont de Nemours (E. I.) and Co., Aiken, S.C. Savannah River Lab.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 23 23.
DP-1201 HC$3.00 MF$0.65

MEASURED ENERGY DEPOSITION RATES FOR VARIOUS NONFISSIONABLE MATERIALS IN A NUCLEAR REACTOR ENVIRONMENT,
Douglas United Nuclear, Inc., Richland, Wash.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 23 23.
DUN-SA-107 HC$3.00 MF$0.65

PROPOSED STUDY ON PROPERTIES OF CONCRETE FOR PRESTRESSED CONCRETE REACTOR VESSEL USAGE.
Final rept.,
Gulf General Atomic, Inc., San Diego, Calif.
F. S. Ople, R. N. White, and R. N. Franklin. 30 Apr 68, 199p
Contract W-7405-eng-26
Prepared in cooperation with Union Carbide Corp., Oak Ridge, Tenn. Nuclear Div.

Descriptors: (*Gas-cooled reactors, Pressure vessels), (*Reactor materials, *Reinforced concrete), Stresses, Creep.
Identifiers: Prestressed concrete.

For abstract, see NSA 23 23.
GA-8305 HC$3.00 MF$0.65

THERMAL EXPANSION AND PHONON FREQUENCY SHIFTS IN NON-PRIMITIVE LATTICES,
Gulf General Atomic, Inc., San Diego, Calif.
For primary bibliographic entry see Field 20L.
For abstract, see NSA 23 23.
GA-9417 HC$3.00 MF$0.65

INTERIM STORAGE OF SPENT HTGR FUEL,
Gulf General Atomic, Inc., San Diego, Calif.
J. J. Shefcik. 15 Apr 69, 15p
Contract AT (04-3)-167

Descriptors: (*Gas-cooled reactors, Reactor fuel processing), (*Reactor fuels, Storage), Costs.

For abstract, see NSA 23 23.
GAMD-9272 HC$3.00 MF$0.65

REFABRICATION COSTS FOR HTGR FUEL ELEMENT COMPONENTS,
Gulf General Atomic, Inc., San Diego, Calif.
H. E. Stelling. 16 Jun 69, 15p
Contract AT (04-3)-167

Descriptors: (*Gas-cooled reactors, *Reactor fuel elements), Costs.

For abstract, see NSA 23 23.
GAMD-9367 HC$3.00 MF$0.65

SPECIFIC ZIRCONIUM ALLOY DESIGN PROGRAM.
Quarterly Progress rept. no. 24,
General Electric Co., San Jose, Calif. Nuclear Fuels Dept.
A. S. Mehner, and H. H. Klepfer. Apr 69, 29p
EURAEC-2118
Contract AT (04-3)-189

Descriptors: (*Reactor fuel cladding, *Zirconium alloys), Radiation damage.

For abstract, see NSA 23 23.
GEAP-10026 HC$3.00 MF$0.65

POWER REACTOR HIGH PERFORMANCE UO2 PROGRAM: FABRICATION OF CENTER-MELT ASSEMBLIES,
General Electric Co., San Jose, Calif. Nuclear Fuels Dept.
D. T. Ikeuye, E. A. Lees, and S. Y. Ogawa. Jun 69, 34p EURAEC-2122
Contract AT (04-3)-189

Descriptors: (*Reactor fuel rods, Melting), Uranium compounds, Manufacturing methods, Dioxides.
Identifiers: Uranium oxides.

For abstract, see NSA 23 23.
GEAP-10032 HC$3.00 MF$0.65

POWER REACTOR HIGH PERFORMANCE UO2 PROGRAM ANALYSIS OF FISSION PRODUCT RELEASE RELATED TO CENTER-MELT FUEL FAILURES,
General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
R. N. Osborne, J. H. Holloway, and C. E. Axtell. Jun 69, 17p EURAEC-2114
Contract AT (04-3)-189

Descriptors: (*Reactor fuel rods, Melting), Fission products, Uranium compounds, Dioxides.
Identifiers: Uranium oxides.

For abstract, see NSA 23 23.
GEAP-10039 HC$3.00 MF$0.65

PERFORMANCE ANALYSIS OF HIGH POWER DENSITY PROGRAM FUEL RODS IRRADIATED IN VBWR-TERMINAL EXAMINATION,
General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
T. J. Pashos, R. N. Duncan, W. H. Arlt, and P. W. Mathay. Sep 68, 136p
Contract AT (04-3)-361

Descriptors: (*Reactor fuel rods, Radiation damage), Boiling water reactors, Reactor fuel cladding.

For abstract, see NSA 23 23.
GEAP-4926 HC$3.00 MF$0.65

ZIRCALOY-CLAD UO2 FUEL ROD EVALUATION PROGRAM.
Quarterly progress rept. no. 4, Aug-Oct 68,
General Electric Co., San Jose, Calif. Nuclear Fuels Dept.
F. H. Megerth. Nov 68, 33p
Contract AT (04-3)-189

Descriptors: (*Reactor fuel rods, Zirconium alloys), Reactor fuel cladding, Uranium compounds.

For abstract, see NSA 23 23.
GEAP-5702 HC$3.00 MF$0.65

EVALUATION OF THE POTENTIAL OF SELECTED ALLOYS FOR USE AS A FUEL CLADDING MATERIAL IN AN LMFBR,
General Electric Co., Cincinnati, Ohio. Missile and Space Div.
C. G. Collins, J. Moteff, and B. A. Chandler. Jun 69, 312p
Contract AT (40-1)-2847
Revision of report dated Nov 67.

Descriptors: (*Reactor fuel elements, *Cladding), Liquid metal cooled reactors, Fast reactors, Breeder reactors.

For abstract, see NSA 23 23.
GEMP-573-Rev HC$3.00 MF$0.65

PERFORMANCE OF TITANIUM AND NIOBIUM ELECTRODES IN AN ELECTROLYTIC DISSOLVER FOR NUCLEAR FUELS,
Idaho Nuclear Corp., Idaho Falls.
R. G. Butzman, and N. J. Kertamus. Aug 69, 15p
Contract AT (10-1)-1230

Descriptors: (*Reactor fuels, *Corrosion), Heating, Titanium, Nitrates, Niobium, Nitric acid, Electrodes.
Identifiers: Dissolving.

For abstract, see NSA 23 23.
IN-1191 HC$3.00 MF$0.65

CORROSION OF A LOW ALLOY STEEL IN A SIMULATED LIQUID-METAL-FUEL REACTOR MIXTURE.
Master's thesis,
Ames Lab., Iowa.
Roger Lee Suchanek. Mar 69, 77p
Contract W-7405-eng-82

Descriptors: (*Reactor materials, *Steel), Corrosion, Liquid metals, Theses.

For abstract, see NSA 23 23.
IS-T-318 HC$3.00 MF$0.65

CALCULATIONAL MODELING EFFECTS ON FAST BREEDER FUEL CYCLE ANALYSIS.
Los Alamos Scientific Lab., N. Mex.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 23 23.
LA-4187 HC$3.00 MF$0.65

CATION EXCHANGE METHOD FOR PREPARING $^{238}PuO_2$ MICROPARTICLES,
Mound Lab., Miamisburg, Ohio.
G. L. Silver. 15 Aug 69, 29p
Contract AT (33-1)-GEN-53

Descriptors: (*Reactor fuel processing, *Plutonium compounds), (*Ion exchange resins, Reactor fuel processing), Particle size, Oxides, Thorium.
Identifiers: Plutonium oxides, Thorium oxides.

For abstract, see NSA 23 23.
MLM-1569 HC$3.00 MF$0.65

STUDY OF THE CATALYTIC ACTIVITY OF MIXED NON-STOICHIOMETRIC URANIUM-THORIUM OXIDES IN CARBON MONOXIDE OXIDATION.
Etude de l'Activite Catalytique des Oxydes Mixtes D'uranium Et de Thorium Non Stoechiometriques Dans l'Oxydation Du Monoxyde de Carbone
Commissariat A L Energie Atomique, Fontenay-Aux-roses (France). Centre D'etudes Nucleaires.
G. Brau. Jun 69, 78p CEA-R-3794
Lang- in French, English Summary

Descriptors: *Carbon monoxide, *Catalytic activity, *Oxidation, *Thorium oxides, *Uranium oxides, Binary mixtures, Chemisorption, Crystal lattices, Solid solutions.

For abstract, see STAR 07 24.
N69-40156 HC$3.00 MF$0.65

DETERMINATION OF THE SELF-SHIELDING PROPERTIES OF GADOLINIUM IN ALUMINA AND NATURAL URANIUM DIOXIDE MATRICES.
Comitato Nazionale Per L Energia Nucleare, Rome (Italy). Laboratorio Tecnografico.
B. Arcipiani. 26 Feb 69, 38p RT/FI/69/20

Descriptors: *Aluminum oxides, *Cylindrical bodies, *Gadolinium, *Shielding, *Uranium oxides, Absorption cross sections, Granular materials, Homogeneity, Nuclear fuel elements, Signal analysis.

For abstract, see STAR 07 24.
N69-41054 HC$3.00 MF$0.65

EFFECT OF NICKEL, SILICON, AND MOLYBDENUM ON THE CORROSION OF AUSTENTIC IRON-CHROMIUM-NICKEL ALLOYS IN SUPERHEATED STEAM,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 23 23.
ORNL-tr-2190 HC$3.00 MF$0.65

FUELS AND MATERIALS DEVELOPMENT PROGRAM.
Quarterly Progress rept. for period ending 31 Mar 69,
Oak Ridge National Lab., Tenn.
P. Patriarca. Aug 69, 270p
Contract W-7405-eng-26
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. See also Quarterly rept. Dec 68, ORNL-4390.

Descriptors: (*Reactor materials, Reviews), (*Reactor fuels, Reviews), Liquid metal cooled reactors, Radiation damage.

For abstract, see NSA 23 23.
ORNL-4420 HC$3.00 MF$0.65

EFFECT OF RADIOLYSIS OF TRIBUTYL PHOSPHATE ON PLUTONIUM YIELD IN THE PUREX PROCESS, AT HIGH PLUTONIUM CONTENTS,
Oak Ridge National Lab., Tenn.
L. Stieglitz, W. Ochsenfeld, and H. Schmieder.
1969, 30p
Trans. of Gesselschaft fuer Kernforschung, mbH. Report (East Germany) KFK 691, EUR 3712 d Nov 68.

Descriptors: (*Reactor fuel processing, *Solvent extraction), (*Plutonium, Solvent extraction), (*Radiation chemistry, *Phosphates), Organic solvents, Alpha particles, Beta particles, Gamma rays, Oxygen, Uranium, East Germany.
Identifiers: *Butyl phosphates, Radiolysis, Translations.

Plutonium fuel and uranium as fertile material are freed from fission products and recovered by liquid-liquid extraction with tributyl phosphate (TBP) (the Purex process). It has also been found that the service life of the extractant used (20-30 vol.% TBP is hydrocarbons as diluent) is limited, due to chemical and radiolytic processes. TBP decomposition leads to the formation of dibutyl phosphate (HDBP) and monobutyl phosphate (H2MBP), of which HDBP in particular is responsible for a deterioration of the process. Thus a study was made of the formation of dibutyl phosphate under the effects of alpha, beta, and gamma rays on the systems of 20 vol. % TBP-CnH2n+2-HNO3-H2O). The presence of an aqueous phase and oxygen seemed to have a pronounced effect on the radiolytic decomposition of TBP during irradiation. When mixed phases were irradiated, an increased HDBP formation of HDBP/Wh was noted. This formation of HDBP was largely dependent on oxygen access during irradiation. The effect of TBP radiolysis on the plutonium yield in the extraction system of TBP-HC/HNO3 was investigated. The plutonium retention after the fourth or fifth re-extraction is proportional to the dose and is directly related to the dibutyl phosphate concentration.
PB-187 967T HC$3.00 MF$0.65

RADIATION CHEMISTRY OF MATERIALS USED IN PLUTONIUM PROCESSING,
Dow Chemical Co., Golden, Colo. Rocky Flats Div.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 23 23.
RFP-1376 HC$3.00 MF$0.65

LIQUID-METAL CORROSION EXPERIMENTS: THE PUMPED CAPSULE,
California Univ., Livermore. Lawrence Radiation Lab.
Rudolf B. Rozsa. 2 Dec 68, 29p
Contract W-7405-eng-48

Descriptors: (*Spacecraft components, Electric power production), (*Reactor materials, Corrosion), Liquid metal coolants, Refractory metal alloys.

For abstract, see NSA 23 23.
UCRL-50511 HC$3.00 MF$0.65

POST-IRRADIATION MICROANALYSIS,
California Univ., Livermore. Lawrence Radiation Lab.
E. D. Albrecht, J. M. Johnson, and W. N. Hayes, Jr.
21 Aug 69, 6p CONF-690910-5
Presented at the Symposium on Developments in Irradiation Testing Technology, Sandusky, Ohio, 9-11 Sep 69.

Descriptors: (*Reactor fuels, *Microstructure), (*Microanalysis, *Reactor fuel rods), Metallography, Chemical analysis.

For abstract, see NSA 23 23.
UCRL-71704 HC$3.00 MF$0.65

FAST REACTOR MIXED-CARBIDE FUEL ELEMENT DEVELOPMENT PROGRAM.
Quarterly progress rept. no. 7, Jan-Mar 69,
United Nuclear Corp., Elmsford, N.Y. Research and Engineering Center.
M. H. Montgomery. 7 Jul 69, 44p
Contract AT (30-1)-3415
See also Quarterly rept. 6, UNC-5238.

Descriptors: (*Fast reactors, *Reactor fuel elements), Carbides, Liquid metal cooled reactors, Breeder reactors.

For abstract, see NSA 23 23.
UNC-5244 HC$3.00 MF$0.65

SOLID MECHANICS WITH APPLICATIONS TO PRESSURIZED WATER REACTORS,
Bettis Atomic Power Lab., Pittsburgh, Pa.
P. L. Pfennigwerth. Sep 69, 113p
Contract AT (11-1)-GEN-14

Descriptors: (*Pressurized water reactors, Reactor materials), (*Reactor materials, Mechanical properties), Stresses, Strain (Mechanics), Elasticity, Plasticity, Deformation, Thermal properties.

For abstract, see NSA 23 23.
WAPD-TM-762 HC$3.00 MF$0.65

SOME STUDIES ON THE OXIDATION STATES OF FISSION-PRODUCT IODINE (129I) IRRADIATED UO2 (LWBR DEVELOPMENT PROGRAM),
Bettis Atomic Power Lab., Pittsburgh, Pa.
J. C. Clayton, and J. M. Riddle. Jul 69, 22p
Contract AT (11-1)-GEN-14

Descriptors: (*Iodine, *Radiochemistry), (*Reactor fuel cladding, Degradation), Radioactive isotopes, Reactor fuel rods, Uranium compounds.
Identifiers: Iodine 131, Iodine 129.

For abstract, see NSA 23 23.
WAPD-TM-851 HC$3.00 MF$0.65

VANADIUM ALLOY CLADDING DEVELOPMENT.
Quarterly Progress rept. for the period ending 31 Mar 69,
Westinghouse Electric Corp., Madison, Pa. Advanced Reactors Div.
E. C. Bishop, R. A. Nadler, and G. A. Whitlow.
May 69, 49p
Contract AT (30-1)-3791

Descriptors: (*Reactor fuel cladding, *Vanadium alloys), Liquid metal cooled reactors, Fast reactors, Breeder reactors.

For abstract, see NSA 23 23.
WARD-3791-34 HC$3.00 MF$0.65

URANIUM-PLUTONIUM CARBIDE DEVELOPMENT.
Quarterly Progress rept. for the period ending 31 Mar 69.
Westinghouse Electric Corp., Madison, Pa. Advanced Reactors Div.
May 69, 68p
Contract AT (30-1)-3791

Descriptors: (*Reactor fuels, Carbides), Uranium compounds, Plutonium compounds.

For abstract, see NSA 23 23.
WARD-3791-36 HC$3.00 MF$0.65

STAINLESS STEEL CLADDING DEVELOPMENT.
Quarterly progress rept. for the period ending 30 Jun 69.
Westinghouse Electric Corp., Madison, Pa. Advanced Reactors Div.
Aug 69, 38p
Contract AT (30-1)-3791

Descriptors: (*Reactor fuel cladding, *Stainless steel), Liquid metal cooled reactors, Breeder reactors.
Identifiers: Steel 316.

For abstract, see NSA 23 23.
WARD-3791-41 HC$3.00 MF$0.65

DEVELOPMENT OF A BORON CONCENTRATION METER.
Technical progress rept. for the period ending 31 Mar 68.
Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Dept.

Apr 68, 35p EURAEC-2005
Contract AT (30-1)-3690

Descriptors: (*Reactor coolants, Monitors), (*Boron, Meters), Neutron absorption, Alcohols, Design.
Identifiers: Mannitol.

For abstract, see NSA 23 23.
WCAP-3690-5 HC$3.00 MF$0.65

DEVELOPMENT OF A BORON CONCENTRATION METER.
Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Dept.
For primary bibliographic entry see Field 18D.
For abstract, see NSA 23 23.
WCAP-3690-6 HC$3.00 MF$0.65

DEVELOPMENT OF A BORON CONCENTRATION METER.
Westinghouse Electric Corp., Pittsburgh, Pa. Nuclear Energy Systems Div.
For primary bibliographic entry see Field 14B.
For abstract, see NSA 23 23.
WCAP-3690-7 HC$3.00 MF$0.65

18K. Reactor Physics

REACTOR PHYSICS DIVISION ANNUAL REPORT, JULY 1, 1967 - JUNE 30, 1968.
Argonne National Lab., Ill.

Jan 69, 445p
Contract W-31-109-eng-38
See also Report dated Jan 68, ANL-7310.

Descriptors: (*Reactor theory, Reports), Reactor operation, Neutron reactions, Thermal reactors, Fast reactors, Reactor safety systems.

For abstract, see NSA 23 23.
ANL-7410 HC$3.00 MF$0.65

THICKNESS CORRECTIONS FOR NEUTRON-ACTIVATED GOLD FOILS.
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18D.
For abstract, see NSA 23 23.
ANL-7545 HC$3.00 MF$0.65

FAST-NEUTRON CROSS SECTIONS OF HAFNIUM, GADOLINIUM, AND SAMARIUM,
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
ANL-7567 HC$3.00 MF$0.65

THE DOPPLER COEFFICIENT OF 238U NEUTRON RESONANCES AND OF THE PWR FUEL CELL,
Brookhaven National Lab., Upton, N.Y.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
BNL-50185 HC$3.00 MF$0.65

TWO-LEVEL RESONANCE FORMULAS AND THEIR APPLICATION OF THE EFFECTIVE RESONANCE INTEGRAL,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
E. Menapace, and M. Motta. 1969, 31p
Trans. of Comitato Nazionale per l'Energia Nucleare, Rome. Rept., PRV-r- (68)-16 31p, (RT/FIMA- (68-2) 1968.

Descriptors: (*Reactor theory, Resonance scattering), Neutron cross sections, Reactor kinetics, Italy.
Identifiers: Resonance cross sections, Translations.

For abstract, see NSA 23 23.
EURFNR-638 HC$3.00 MF$0.65

SCANAL: A SINGLE CHANNEL SYNTHESIS DEPLETION CODE WITH TRIANGULAR MESH IN THE HORIZONTAL PLANE,
Gulf General Atomic, Inc., San Diego, Calif.
R. C. Traylor, V. Malakhof, and S. C. Leighton. 1 Jul 69, 143p
Contract AT (04-3)-633

Descriptors: (*Power reactors, Design), (*Reactor lattice parameters, Computer programs), Reactor moderators, Reactor fuels, Reactor coolants, Heat transfer, Temperature.
Identifiers: SCANAL computer code.

For abstract, see NSA 23 23.
GA-9423 HC$3.00 MF$0.65

STOCHASTIC DETERMINATION OF NEUTRONIC COUPLINGS IN REACTORS BY CORRELATION AND PROBABILITY TECHNIQUES.
Reactor Centrum Nederland, Petten.
A. Dalfes, and E. Tuerkcan. Aug 69, 47p RCN-110
Contract NATO-239
Spon- Sponsored Partly By Neth. Organ. for Sci. Res.

Descriptors: *Coupling coefficients, *Neutron counters, *Nuclear reactors, *Probability distribution functions, *Reactor cores, Circuit diagrams, Correlation coefficients, Stochastic processes.

For abstract, see STAR 07 24.
N69-40038 HC$3.00 MF$0.65

SPACE SYNTHESIS - AN APPLICATION OF THE SYNTHESIS METHOD TO TWO AND THREE-DIMENSIONAL MULTIGROUP NEUTRON DIFFUSION EQUATIONS.
Synthese Spatiale - Une Application de La Methode de Synthese Aux Equations de Diffusion Neutronique Multigroupe A Deux Et Trois Dimensions
Commissariat A L Energie Atomique, Saclay (France). Centre D'etudes Nucleaires.
H. Nguyen-ngoc. May 09, 72p CEA-R-3713
Lang- in French, English Summary

Descriptors: *Diffusion theory, *Dimensional analysis, *Group theory, *Neutrons, *Particle diffusion, Chebyshev approximation, Circular cylinders, Computer programming, Finite difference theory, Independent variables.

For abstract, see STAR 07 24.
N69-40155 HC$3.00 MF$0.65

WUNDEE - A ONE-DIMENSIONAL RADIAL HEAT- TRANSFER COMPUTER PROGRAM FOR CONDUCTIVE AND RADIATIVE HEAT-TRANSFER SITUATIONS SUCH AS ARE MET IN REACTOR RIGS OF CYLINDRICAL FORM.
United Kingdom Atomic Energy Authority, Harwell (England). Atomic Energy Research Establishment.
R. F. Cox, and S. Llewellyn. Feb 69, 53p AERE-M-2165

Descriptors: *Computer programs, *Conductive heat transfer, *Nuclear research and test reactors, *Radiative heat transfer, Heat sinks, Ibm 360 computer, Temperature distribution, Thermophysical properties.

For abstract, see STAR 07 24.
N69-40959 HC$3.00 MF$0.65

CRITICALITY PROBLEMS IN THE ESSOR PLANT.
Problemi Di Criticita Nel Complesso Essor
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
S. Ragusa, and R. Ricchena. Jul 69, 51p EUR-4285-I
Lang- in Italian, English Summary

Descriptors: *Critical mass, *Nuclear fuel elements, *Organic cooled reactors, *Reactor safety, Nuclear reactor control, Uranium carbides, Uranium oxides, Uranium 238.

For abstract, see STAR 07 24.
N69-41294 HC$3.00 MF$0.65

SUPERTOG: A PROGRAM TO GENERATE FINE GROUP CONSTANTS AND P sub n SCATTERING MATRICES FROM ENDF/B,
Oak Ridge National Lab., Tenn.
R. Q. Wright, J. L. Lucius, N. M. Greene, and C. W. Craven, Jr. Sep 69, 78p
Contract W-7405-eng-26

Descriptors: (*Neutron cross sections, Programming (Computers)), Neutron reactions, Groups (Mathematics), Nuclear resonance, Neutron spectrum.
Identifiers: SUPERTOG computer program, ENDF B (Evaluated Nuclear Data File B), Evaluated nuclear data file B.

For abstract, see NSA 23 23.
ORNL-TM-2679 HC$3.00 MF$0.65

INHERENT NEUTRON SOURCE IN MSRE WITH CLEAN 233U FUEL,
Oak Ridge National Lab., Tenn.
R. C. Steffy, Jr. 10 Aug 69, 22p

Descriptors: (*Circulating fuel reactors, *Reactor fuels), (*Neutron flux, Sources), Uranium, Alpha particle reactions, Decay schemes.
Identifiers: Molten salt reactor experiment, *Molten salt nuclear fuels.

For abstract, see NSA 23 23.
ORNL-TM-2685 HC$3.00 MF$0.65

WEIGHTING AND BIASING OF A MONTE CARLO CALCULATION FOR VERY DEEP PENETRATIONS.
Oak Ridge National Lab., Tenn.
Jeanne-Marie Lanore. 1969, 17p
Trans. from Commissariat a l'Energie Atomique, Paris. Rapport (France) 16p 1969.

Descriptors: (*Neutron transport theory, *Monte Carlo method), Penetration, France.

For abstract, see NSA 23 23.
ORNL-tr-2213 HC$3.00 MF$0.65

REPORTS TO THE AEC NUCLEAR CROSS SECTIONS ADVISORY COMMITTEE. MEETING HELD AT OAK RIDGE NATIONAL LABORATORY, OAK RIDGE TENNESSEE, APRIL 15-17, 1969,
Nuclear Cross Sections Advisory Committee (AEC).
For primary bibliographic entry see Field 20H.
For abstract, see NSA 23 23.
WASH-1127 HC$3.00 MF$0.65

18L. Reactors (Power)

STUDY OF THE CONTROL OF A FAST-REACTOR NUCLEAR POWER PLANT ON A HYBRID COMPUTER (Etude de la Regulation d'Une Centrale Nuclearire a Reacteur Rapide sur Calculateur Hybride),
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 23 23.
ANL-Trans-771 HC$3.00 MF$0.65

OPTIMUM SPATIAL FLUX CONTROL PROJECT: PHASE I. CEXE: A THREE-DIMENSIONAL NODAL METHOD FOR ANALYSIS OF XENON OSCILLATIONS AND CONTROL,
Combustion Engineering, Inc., Windsor, Conn. Nuclear Power Dept.

For primary bibliographic entry see Field 18I.
For abstract, see NSA 23 23.
CEND-3932-1 HC$3.00 MF$0.65

OPTIMUM SPATIAL FLUX CONTROL PROJECT: PHASE II. XENON OSCILLATION STUDIES FOR THE PICKERING REACTOR,
Combustion Engineering, Inc., Windsor, Conn. Nuclear Power Dept.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 23 23.
CEND-3932-2 HC$3.00 MF$0.65

SAXTON REACTOR. LICENSE NO. DPR-4: TECHNICAL SPECIFICATIONS, CHANGE NO. 32, AMENDMENT 4.
Saxton Nuclear Experimental Corp., Pa.
For primary bibliographic entry see Field 18E.
For abstract, see NSA 23 23.
DOCKET-50146-40 HC$3.00 MF$0.65

SAXTON REACTOR. LICENSE NO. DPR-4: AMENDMENT 5 TO TECHNICAL SPECIFICATIONS CHANGE NO. 32.
Saxton Nuclear Experimental Corp., Pa.
For primary bibliographic entry see Field 18E.
For abstract, see NSA 23 23.
DOCKET-50146-41 HC$3.00 MF$0.65

SCANAL: A SINGLE CHANNEL SYNTHESIS DEPLETION CODE WITH TRIANGULAR MESH IN THE HORIZONTAL PLANF,
Gulf General Atomic, Inc., San Diego, Calif.
For primary bibliographic entry see Field 18K.
For abstract, see NSA 23 23.
GA-9423 HC$3.00 MF$0.65

NUCLEAR ENERGY CENTERS: THE PROBLEMS OF IMPLEMENTATION,
Oak Ridge National Lab., Tenn.
J. A. Ritchey. Aug 69, 18p
Contract W-7405-eng-26

Descriptors: (*Power reactors, *Foreign aid), (*Agriculture, Power reactors), Sociology, Management planning.
Identifiers: *Agro-industrial complexes, Developing countries.

For abstract, see NSA 23 23.
ORNL-4295 HC$3.00 MF$0.65

18N. SNAP Technology

REACTOR-THERMOELECTRIC SYSTEMS FOR NASA SPACE STATION,
Atomics International, Canoga Park, Calif.
J. D. Gylfe, and R. A. Johnson. 1 Jul 69, 93p
Contract AT (04-3)-701

Descriptors: (*Space stations, *Nuclear power plants), Nuclear reactors, Thermoelectricity.
Identifiers: SNAP.

For abstract, see NSA 23 23.
AI-AEC-12839 HC$3.00 MF$0.65

LARGE RADIOISOTOPE HEAT SOURCE CAPSULE PROGRAM. TOPICAL REPORT NO. 7. CAPSULE FIRE TEST RESULTS,
Atomics International, Canoga Park, Calif.
J. M. Harris. 29 May 69, 54p
Contract AT (29-2)-2338
See also Topical rept. 6, AI-AEC-12822. PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Radioactive isotopes, Containers), Fire safety, Heaters.
Identifiers: Aerospace nuclear safety, *Radioisotope heat sources.

For abstract, see NSA 23 23.
AI-AEC-12841 HC$3.00 MF$0.65

RESEARCH AND DEVELOPMENT OF VACUUM FOIL-TYPE INSULATION FOR RADIOISOTOPE POWER SYSTEMS.
Quarterly progress rept. Mar-May 69,
Thermo Electron Corp., Waltham, Mass.
J. Carvalho, J. B. Dunlay, M. L. Paquin, and V. L. Poirier. 28 Jul 69, 27p
Contract AT (30-1)-3634

Descriptors: (*Nuclear power plants, Thermal insulation), (*Thermal insulation, *Foils), Vacuum, Radioactive isotopes.

For abstract, see NSA 23 23.
ALO-3634-13 HC$3.00 MF$0.65

SNAP-21, PHASE II. DEEP SEA RADIOISOTOPE-FUELED THERMOELECTRIC GENERATOR POWER SUPPLY SYSTEM.
Quarterly rept. no. 12, 1 Apr-30 Jun 69.
Minnesota Mining and Mfg. Co., St. Paul. Electrical Products Group.
Jun 69, 186p
Contract AT (30-1)-3691
See also Quarterly rept. 11, MMM-3691-47.

Descriptors: (*Nuclear power plants, Radioactive isotopes), Auxiliary power plants, Thermoelectricity.
Identifiers: SNAP, SNAP 21 isotopic generators, *Radioisotope thermoelectric devices.

For abstract, see NSA 23 23.
MMM-3691-52 HC$3.00 MF$0.65

ONE VOLT ISOTOPIC MICROGENERATORS.
les Microgenerateurs Radioisotopiques 1 Volt
Commissariat A L Energie Atomique, Saclay (France). Centre D Etudes Nucleaires.
R. Bomal, P. Delaquaize, and B. Devin. Jun 69, 75p
CEA-R-3834
Lang- in French, English Summary

Descriptors: *Direct power generators, *Energy conversion, *Radioisotope batteries, *Thermionic converters, Electric potential, Energy conversion efficiency, Photoelectric generators, Thermoelectric generators, Volt-ampere characteristics.

For abstract, see STAR 07 24.
N69-40586 HC$3.00 MF$0.65

DEVELOPMENT OF EMITTERS AND COLLECTOR MULTI- LAYER SYSTEMS.
Entwicklung Non Emittern Und Kollektormehrschichtsystemen
Techtran Corp., Glen Burnie, Md.
H. Hubner. Oct 69, 92p NASA-TT-F-12570, W-68-57
Contract NASW-1695
Coll- 92 P Refs Tran- Transl. Into English From German Research Report, Aug. 1968 118 P

Descriptors: *Aerospace engineering, *Reactor cores, *Spacecraft, *Thermionic power generation, Accumulators, Fission products, Reactor design, Thermionic cathodes, Tungsten, Uranium oxides, Venting.

For abstract, see STAR 07 24.
N69-40593 HC$3.00 MF$0.65

ADVANCED SPACE NUCLEAR POWER PROGRAM.
Quarterly rept., Jul-Sep 67.
California Univ., Livermore. Lawrence Radiation Lab.
1967, 12P

Descriptors: (*Nuclear power plants, Auxiliary power plants), (*Auxiliary power plants, Electric power production), Reactor materials.
Identifiers: SNAP.

For abstract, see NSA 23 23.
UCRL-50004-67-3-Pt.2 HC$3.00 MF$0.65

ADVANCED SPACE NUCLEAR POWER PROGRAM.
Quarterly rept., Oct-Dec 67.
California Univ., Livermore. Lawrence Radiation Lab.

1967, 73P

Descriptors: (*Nuclear power plants, Power reactors), (*Power reactors, Spacecraft components), Auxiliary power plants, Reactor materials.
Identifiers: SNAP.

For abstract, see NSA 23 23.
UCRL-50004-67-4-Pt.1 HC$3.00 MF$0.65

FAST REACTOR SYSTEMS FOR SECONDARY SPACE POWER,
California Univ., Livermore. Lawrence Radiation Lab.
W. N. Podney, E. Garelis, B. L. Koponen, and J. P. Layton. 19 Jun 68, 28p CONF-680802-8
Contract W-7405-eng-48
Presented at the Annual Intersociety Energy Conversion Engineering Conference (3rd), Boulder, Colo. 13-18 Aug 68.

Descriptors: (*Nuclear power plants, Fast reactors), (*Fast reactors, Auxiliary power plants), Spacecraft components, Thermionic converters, Rankine cycle.
Identifiers: SNAP.

For abstract, see NSA 23 23.
UCRL-71149 HC$3.00 MF$0.65

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

RESEARCH INTO THE DETONATION OF AMMONITE PZhV-20 AND CERTAIN OTHER EXPLOSIVES (Issledovanie Detonatsii Ammonita PZhV-20 i Nekotorykh Drugikh VV),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 19D.
PB-188 144T HC$3.00 MF$0.65

INITIATION OF DETONATION BY SHOCK WAVES IN CAST AND PELLETIZED TNT (Initsirovanie Detonatsii Udarnymi Volnami v Litom i Pressovanom Trotile),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 19D.
PB-188 145T HC$3.00 MF$0.65

THE VAPOR PRESSURE OF PENTAERYTHRITOL TETRANITRATE (PETN) IN THE TENPERATURE RANGE OF 50 TO 98 DEGREES CENTIGRADE,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 23 23.
UCRL-50704 HC$3.00 MF$0.65

19C. Combat Vehicles

THE EQUATIONS OF MOTION FOR A SPECIAL CLASS OF WEAPON-VEHICLE SYSTEMS.
Iowa Univ Iowa City Dept of Mechanics and Hydraulics
James G. Andrews. Jul 69, 57p Rept no. THEMIS-UI-11
Contract DAAF03-69-C-0014

Report on Vibration and Stability of Military and other Complex Vehicular Systems.

Descriptors: (*Armored vehicles, *Guns), (*Gunnery, Effectiveness), Target acquisition, Recoil mechanisms, Gun turrets, Equations of motion, Mathematical models, Stability, Projectiles, Design, Momentum, Force (Mechanics), Efficiency, Optimization.
Identifiers: *Weapons carriers, Target retention, Themis project, Evaluation.

In order to evaluate the preliminary design of any weapon-vehicle system and to predict the effectiveness and efficiency of its performance under a variety of environmental conditions, it is necessary to (1) construct a mathematical model of the system, (2) derive the equations which govern the motion of the components of this model during a typical fire mission, (3) obtain the solutions to these equations and the variations in these solutions due to changes in the system parameters, changes in the motion of the target relative to the vehicle, changes in the vehicle's environment and its motion in this environment, and changes in the characteristics of the input forcing functions used to properly align the weapon, and finally, (4) verify the theoretical predictions obtained for the system model by performing a series of experimental tests on a system prototype. This report is concerned with the first two portions of this overall scheme of design evaluation, namely (1) the construction of a model for a certain class of weapon-vehicle systems, and (2) the derivation of the equations governing the motion of the components of the model during a typical fire mission. (Author)
AD-698 014 HC$3.00 MF$0.65

19D. Explosions, Ballistics, and Armor

LONG RANGE PROPAGATION OF SPHERICAL SHOCKWAVES FROM EXPLOSIONS IN AIR,
Naval Ordnance Lab White Oak Md
D. L. Lehto, and R. A. Larson. 22 Jul 69, 23p Rept no. NOLTR-69-88

Descriptors: (*Shock waves, Airburst), Nuclear explosions, TNT, Low-pressure research, Nuclear industrial applications, Safety, Mathematical models, Curve fitting, Spheres.
Identifiers: Overpressure, Spherical waves, Hydrocode calculations, Computerized simulation.

Hydrocode calculations for spherical shock propagation using the artificial-viscosity method are carried out to 0.2 psi overpressure for a nuclear explosion and for a TNT explosion. An ideal-gas integration from the literature is used to extend the results to .00016 psi. (Author)
AD-698 121 HC$3.00 MF$0.65

FEASIBILITY STUDY OF A BALLOON SKYHOOK,
Naval Ordnance Lab., White Oak, Md.
Gruver H. Martin. 12 Dec 67, 16p NOLTR-67-191
Distribution Limitation now Removed.

Descriptors: (*Blast, Measurement), (*Balloons, Instrumentation), (*Phased arrays, Airborne), Explosions, Shock waves, Altitude, Sensors, Pressure gages, Cables (Mechanical), Payload, Glass textiles, Weather, Feasibility studies, Mooring, Flight testing, Stresses, Transducers, Photographs, Launching, Stabilized platforms, Performance (Engineering).
Identifiers: *Balloon skyhooks, Pressure sensors, Evaluation.

An experiment was conducted to determine the feasibility of using a large captive balloon to deploy an array of pressure sensors vertically above a large explosion. A British World War II type barrage balloon was used up to an altitude of 8,600 ft above mean sea level. The payload consisted of a 5-station gage array distrubuted along the tether. A 5/16-in.-diameter stranded fiberglass cable was used for the single tethering line. As a result of the tests, it is concluded that a distributed payload of up to 750 lbs can be deployed in a near vertical and very stable array with a barrage-type balloon up to 10,000 ft above mean sea level. The system can be launched and maintained aloft under fairly adverse weather conditions and has significant advantages over other methods of gage positioning, e.g., rocket emplacement, in terms of simplicity, reliability, and economy. (Author)
AD-827 280 HC$3.00 MF$0.65

A UNIVERSAL METHOD FOR DETERMINING THE EFFECTS OF AN EXPLOSION.
Un Metodo Generale Per La Determinazione Degli Effetti Di Una Esplosione
Rome Univ. (Italy). Centro Ricerche Aerospaziali.
M. Sirinian. Jul 68, 26p REPT-16
Lang- in Italian, English Summary

Descriptors: *Explosions, *Fluid mechanics, *Geometry, *Planetary surfaces, Blast loads, Homogeneity, Mathematical models, Overpressure, Thermodynamics, Yield.

For abstract, see STAR 07 24.
N69-40231 HC$3.00 MF$0.65

RESEARCH INTO THE DETONATION OF AMMONITE PZhV-20 AND CERTAIN OTHER EXPLOSIVES (Issledovanie Detonatsii Ammonita PZhV-20 i Nekotorykh Drugikh VV),
California Univ., Berkeley. Lawrence Radiation Lab.
A. N. Dremin, K. K. Shvedov, and V. A. Veretennikov. Nov 69, 33p UCRL-Trans-10405
Trans. of Vzryvnoe Delo (USSR) v52 n9 p10-25 1963, by J. Mulhaus.

Descriptors: (*Explosive materials, Detonations), Detonation waves, Propagation, Velocity, Magnetic fields, Probes (Electromagnetic), Interfaces, Reaction kinetics, TNT, RDX, USSR.
Identifiers: Translations, Ammonite, *Ammonium nitrate.

Measurement of the parameters of the detonation wave (particle velocity behind the detonation front and others) constitutes an important factor in the determination of the detonation mechanism of commercial explosives. The so-called cut-off method of determining the mass velocity used in research into ammonium nitrate is not very suitable because of the considerable curvature of the wave front. The electromagnetic method is better suited for such explosives. This was used for an experimental determination of the parameters of a detonation wave in permissible ammonite PZhV-20. The data are compared with the detonation parameters of individual explosives (TNT, hexogen) and of a cast mixture of hexogen and TNT (64% hexogen, 36% TNT), the so-called 'V' composition.
PB-188 144T HC$3.00 MF$0.65

INITIATION OF DETONATION BY SHOCK WAVES IN CAST AND PELLETIZED TNT (Initsirovanie Detonatsii Udarnymi Volnami v Litom i Pressovanom Trotile),
California Univ., Berkeley. Lawrence Radiation Lab.
A. N. Dremin, and S. A. Koldunov. Nov 69, 29p UCRL-Trans-10408
Trans. of Vzryvnoe Delo (USSR) v63 n20 p37-50 1967, by J. Mulhaus.

Descriptors: (*TNT, Detonations), (*Explosives initiators, Shock waves), Detonation waves, Velocity, Propagation, Pellets, Interfaces, Electrical conductance, Reaction kinetics, USSR.
Identifiers: Translations.

Up to the present, few experiments have been undertaken on the process of detonation in solid explosives. A study was made of the initiation of detonation by shock waves in finely crystalline cast and pelletized TNT with initial densities of 1.62 and 1.59 g/cc respectively. (Author)
PB-188 145T HC$3.00 MF$0.65

19F. Guns

LONGITUDINAL FORCES REQUIRED WITH LOOSE LINER BARREL CONSTRUCTION,
Naval Ordnance Lab White Oak Md
Jack E. Goeller, and Victor C. D. Dawson. 15 Jul 69, 14p Rept no. NOLTR-69-139

Descriptors: (*Hypervelocity guns (Ordnance), Gun barrels), (*Hypervelocity guns, Gun barrels), (*Gun barrels, Assembling), Naval guns, Force (Mechanics), Maintenance, Friction, Alignment, Tolerances (Mechanics).
Identifiers: *Loose liner gun barrel construction, *Gun barrel linings, Gun launchers, Autofrettage, Straightness.

A previous study demonstrated the advantages that could be obtained in using loose liner naval gun barrel construction, particularly if the liner is autofrettaged. This report deals with the longitudinal forces required to assemble and disassemble such constructions and shows that with close control of tube straightness and initial clearance, these forces are relatively small. (Author)
AD-697 930 HC$3.00 MF$0.65

THE EQUATIONS OF MOTION FOR A SPECIAL CLASS OF WEAPON-VEHICLE SYSTEMS.
Iowa Univ Iowa City Dept of Mechanics and Hydraulics
For primary bibliographic entry see Field 19C.
AD-698 014 HC$3.00 MF$0.65

ANALOG COMPUTER STABILIZATION INVESTIGATION OF LAGRANGIAN EQUATIONS.
Army Weapons Command Rock Island Ill Science and Technology Lab
For primary bibliographic entry see Field 12A.
AD-698 021 HC$3.00 MF$0.65

19G. Rockets

ANALYTICAL SIMULATION OF THE THREE-DIMENSIONAL FLOW-FIELD ABOUT A SHIP.
Michigan State Univ East Lansing Div of Engineering Research
For primary bibliographic entry see Field 13J.
AD-697 989 HC$3.00 MF$0.65

AEROBALLISTIC, PERFORMANCE, WIND EFFECTS AND PAYLOAD IMPACT DISPERSION ANALYSES AND FLIGHT TEST DATA FOR THE SINGLE-STAGE SANDHAWK ROCKET SYSTEM,
Sandia Labs., Albuquerque, N. Mex.
Gerald G. Wilson, and George W. Stone. Jul 69, 129p

Descriptors: (*Sounding rockets, Aerodynamic characteristics), Flight testing, Wind.
Identifiers: Sandhawk rockets.

For abstract, see NSA 23 23.
SC-DR-69-291 HC$3.00 MF$0.65

20. PHYSICS

20A. Acoustics

THE USE OF RAY METHODS AND FIRST ORDER DIFFRACTION CORRECTIONS.
Technical memo.,
Navy Underwater Sound Lab New London Conn

H. W. Marsh, Jr. 27 Sep 54, 16p Rept no. USL-TM-1100-61-54

Descriptors: (*Underwater sound, Sound transmission), Wave functions, Refraction, Interference, Corrections, Diffraction.

In many wave problems, ray methods are convenient and accurate. Exact in the limit of high frequency, and employing simple formulae, these methods lose utility at low frequencies or because of inadequate numerical schemes for interpreting them. Correction terms are given which permit an extension of ray methods to lower frequencies (and at the same time providing an estimation of the validity of the high frequency limit). Some useful formulae and numerical schemes for ray tracing and the quantitative evaluation of refraction (spreading) and interference are given.
AD-697 927 HC$3.00 MF$0.65

ACOUSTIC PROPAGATION IN A STRATIFIED MEDIUM.
Research rept.,
Raytheon Co New London Conn Marine Research Lab
Frederick R. DiNapoli. 13 Aug 69, 90p USL-1046
Contract N00014-67-C-0241
Prepared in cooperation with Rhode Island Univ., Kingston. Dept. of Electrical Engineering, Contract N140 (70024)78298B.

Descriptors: (*Underwater sound, *Sound transmission), Partial differential equations, Numerical analysis, Hydrodynamics, Green's function, Integral equations, Hypergeometric functions, Integration, Theses.
Identifiers: Wave equations, Numerical integration, Eigenvalues.

The solution for the acoustic field due to a monochromatic point source located in a stratified medium is obtained by direct numerical integration of the relevant hydrodynamical field equations. The application of the method is demonstrated via various examples and shown to provide accurate results. In order to implement the formalism, it is necessary to solve for the depth dependent Green's function associated with the reduced wave equation. Two general methods of solution are presented and discussed. The first is an exact representation in terms of hypergeometric functions. The second has its foundations in the theory of integral equations. (Author)
AD-697 928 HC$3.00 MF$0.65

MAGNETOELASTIC LOVE WAVES.
Sperry Rand Research Center Sudbury Mass
For primary bibliographic entry see Field 20C.
AD-698 193 HC$3.00 MF$0.65

SUBJECTIVE ANALYSIS OF SPEECH IN HELIUM ENVIRONMENTS,
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 6K.
AD-698 222

RAY PATH IN A LINEARLY MOVING INHOMOGENEOUS LAYERED OCEAN MODEL,
Houston Univ., Tex. Dept. of Electrical Engineering.
H. S. Hayre, and I. Tripathi. 1967, 9p
Contract Nonr-4492 (02)
Distribution Limitation now Removed.

Descriptors: (*Underwater sound, Sound transmission), Ocean models, Acoustic properties, Velocity, Motion, Fluid dynamic properties, Ocean models.
Identifiers: Marine layers.

When the speed of sound is constant and velocity of the medium is varying linearly with depth, the ray path can be described by an arc of a circle. If the speed of sound is decreasing linearly with depth, and the medium is moving with a constant velocity. The ray path can also be approximated as an arc of a circle. If both the speed of sound and velocity of the medium do not vary with depth, the ray path is a straight line.
AD-806 957 HC$3.00 MF$0.65

THE CALCULATION OF THE FLUCTUATING LIFT ON A CIRCULAR CYLINDER AND ITS APPLICATION TO THE DETERMINATION OF AEOLIAN TONE INTENSITY,
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 1A.
N64-16539 HC$3.00 MF$0.65

THE PHYSICAL PICTURE OF FLOW NOISE,
Advisory Group for Aeronautical Research and Development, Paris (France).
Eugen J. Skudrzyk, and Gillian P. Haddle. Apr 63, 43p AGARD-462
NATO furnished. Presented at AGARD Specialists' Meeting on 'The Mechanism of Noise Generation in Turbulent Flow' At the Training Center for Experimental Aerodynamics, Rhode-Saint-Genese, Belgium, 1-5 Apr 63.

Descriptors: (*Underwater sound, *Fluid flow), Noise, Statistical analysis, Surface roughness, Boundary layer, Reduction, Acoustic insulation, Vibration.

The study of flow noise is based on exact computation, on model studies, and on statistical analysis. Measurements were performed in the water tunnel and with the aid of buoyant units. The effect of surface roughnesses was studied with a rotating cylinder. Special attention is given to radiated noise, since hydrophones used in underwater acoustics are relatively large and record the radiation noise only. Flow noise was reduced by tripping the boundary layer by coating the surface with sound-absorbent varnishes. It seems probable that flow noise can be reduced by reducing wall vibrations. (Author)
N64-18991 HC$3.00 MF$0.65

EFFECT OF JET TEMPERATURE ON JET AND PURE TONE NOISE RADIATION.
Lockheed-georgia Co., Marietta.
H. E. Plumblee, G. A. Wynne, and B. T. Zinn. Nov 69, 73p NASA-CR-1472
Contract NAS1-8443
Coll- 73 P Refs

Descriptors: *Acoustic measurements, *High temperature tests, *Jet aircraft noise, *Noise intensity, *Sound waves, Noise spectra, Sound pressure, Turbofan engines, Turbojet engines.

For abstract, see STAR 07 24.
N69-40439 HC$3.00 MF$0.65

20B. Crystallography

STUDIES IN TANTALUM OXIDE CRYSTAL GROWTH.
Rept. for Jan-Jun 69,
Aerospace Corp El Segundo Calif Lab Operations
Gerard M. Wolten, and Armand B. Chase. 1 Oct 69, 16p* Rept no. TR-0066 (5250-10)-2 SAMSO-TR-69-357
Contract F04701-69-C-0066

Descriptors: (*Tantalum compounds, *Crystal growth), (*Niobium compounds, Crystal growth), Vanadates, Solubility, Crystal structure.
Identifiers: *Tantalum oxides, *Niobium oxides.

Crystals of beta-Ta2O5 and gamma-Nb2O5 have been grown from molten KPO3 and mixtures of KPO3 and KVO3. A search for additional polymorphs of beta-Ta2O5 in this system has instead revealed five not hitherto reported tantalum compounds containing potassium or phosphorus or both and, in one case, vanadium. (Author)
AD-697 961 HC$3.00 MF$0.65

GROUP IV AND V TRANSITION METAL RICH CHALCONIDE X-RAY POWDER DIFFRACTION DATA,
Ames Lab., Iowa.
H. F. Franzen, J. G. Smeggil, and B. R. Conrad. Aug 69, 18p*
Contract W-7405-eng-82
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Sulfides, *X-ray diffraction analysis), (*Selenides, X-ray diffraction analysis), Titanium compounds, Zirconium compounds, Hafnium compounds, Niobium compounds, Tantalum compounds.

For abstract, see NSA 23 23.
IS-2133 HC$3.00 MF$0.65

BIBLIOGRAPHY ON THE HIGH TEMPERATURE CHEMISTRY AND PHYSICS OF MATERIALS,
National Bureau of Standards, Washington, D.C. Inst. for Materials Research.
For primary bibliographic entry see Field 7D.
NBS-SP-315-3 HC$1.00 MF$0.65

A FLOATING ZONE TECHNIQUE FOR THE GROWTH OF CARBIDE SINGLE CRYSTALS.
Martin Marietta Corp., Baltimore, Md. Research Inst. for Advanced Studies.
G. E. Hollox, and W. Precht. May 68, 21p NASA-CR-106334, TR-2
Contracts NASW-1290, DA-31-124-ARO/D/467
Conf- Presented At Intern. Conf. on Crystal Growth Birmingham, Engl., Jul. 1968 Subm- Submitted for Publication

Descriptors: *Crystal growth, *Floating, *Single crystals, *Vanadium carbides, *Zone melting, Chemical composition, Cubic lattices, Phase diagrams, Refractory materials.

For abstract, see STAR 07 24.
N69-40027 HC$3.00 MF$0.65

IONIC CONDUCTIVITY OF LANTHANUM FLUORIDE.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
For primary bibliographic entry see Field 20L.
For abstract, see STAR 07 24.
N69-40056 HC$3.00 MF$0.65

PRODUCTION AND PROPERTIES OF RARE EARTH METAL MONOCRYSTALS.
Polucheniyei I Svoystva Monokristallov Redkozemelnykh Metallov
Techtran Corp., Glen Burnie, Md.
YE. M.Savitskiy. Oct 69, 9p NASA-TT-F-12632
Contract NASW-1695
Coll- 9 P Refs Tran- Transl. Into English From Rost Kristallov (Moscow), V. 6, 1965, P 301-307

Descriptors: *Crystal growth, *Physical properties, *Rare earth elements, *Single crystals, Distillation, High vacuum, Magnetic properties, Recrystallization.

For abstract, see STAR 07 24.
N69-40357 HC$3.00 MF$0.65

HETEROEPITAXY OF 3-5 COMPOUND SEMICONDUCTORS ON INSULATING SUBSTRATES INTERIM REPORT.
North American Rockwell Corp., Anaheim, Calif. Physical Sciences Dept. of Autonetics.
H. M. Manasevit, and A. C. Thorsen. May 69, 69p NASA-CR-86258
Contract NAS12-2010

Descriptors: *Aluminum oxides, *Epitaxy, *Gallium arsenides, *Semiconducting films, *Substrates, Carrier injection, Carrier mobility, Charge carriers, Thick films, Thin films.

For abstract, see STAR 07 24.
N69-40383 HC$3.00 MF$0.65

RESEARCH ON LOW VOLTAGE ELECTROLUMINESCENT DEVICES WITH STORAGE, PHASE 2 FINAL TECHNICAL REPORT.
Marquardt Corp., Van Nuys, Calif.
For primary bibliographic entry see Field 9A.
For abstract, see STAR 07 24.
N69-40457 HC$3.00 MF$0.65

LAYER MODEL OF SELENIUM SINGLE CRYSTALS.
Helsinki Univ. (Finland). Electronics Lab.
T. Salo. 30 Nov 67, 45p

Descriptors: *Dielectric properties, *Selenium, *Single crystals, Barrier layers, Covalent bonds, Crystal dislocations, Crystal lattices, Electric fields, Electrical resistivity, Temperature effects.

For abstract, see STAR 07 24.
N69-40716 HC$3.00 MF$0.65

HYDROTHERMAL SYNTHESIS OF CHRYSOBERYL (Hydrothermalsynthese von Chrysoberyll),
California Univ., Berkeley. Lawrence Radiation Lab.
D. Rykl, and J. Bauer. Oct 69, 20p UCRL-Trans-10400
Trans. of Kristall und Technik (East Germany) v3 n3 p361-373 1968, by B. Hazzard.

Descriptors: (*Minerals, Synthesis (Chemistry)), (*Crystal growth, Minerals), Beryllium oxides, Alumina, Hydroxides, Solvents, Phase studies, Crystallization, East Germany.
Identifiers: *Chrysoberyl, Translations.

Chrysoberyl was prepared by hydrothermal synthesis from a mixture of BeO and Al2O3. As solvent the NaOH solution of a concentration from 5 to 25 percent by weight was applied in the temperature range from 450 to 590C and a pressure from approximately 600 to 650 at. Also the recrystallization of synthetic microcrystalline chrysoberyl in the NaOH solutions on hydrothermal conditions has been verified. The use of Na2B4O7, H3BO3, and NaHCO3 solutions on given conditions seems to be ineffective for the transport mechanism. Pure chrysoberyl was grown only from 5% and 10% NaOH solutions at 590C, the attained size of the crystals was 0.5 mm. From 10% and 20% NaOH solutions at 450C only the bromelite (BeO) crystallized. The morphology of chrysoberyl crystals seems to be influenced more by the temperature gradient than by the used concentration of the NaOH solutions. (Author)
PB-188 097T HC$3.00 MF$0.65

20C. Electricity and Magnetism

MAGNETOELASTIC LOVE WAVES.
Final rept. 1 Oct 68-30 Sep 69,
Sperry Rand Research Center Sudbury Mass
Herbert Matthews. Nov 69, 43p* Rept no. SRRC-CR-69-22
Contract N00014-69-C-0027

Descriptors: (*Mechanical waves, Propagation), (*Sound, *Transducers), Piezoelectric transducers, Magnetostricture elements, Rayleigh waves, Semiconducting films, Substrates, Crystals, Ultrahigh frequency, Radio fields, Magnetic properties, Wave functions, Mechanical waves, Dispersion relations.
Identifiers: *Magnetoelastic surface waves, Magnetic substrates, Piezomagnetism, Signal processing, Love waves, Thin film transducers, Magnetostatics, Planar devices.

The properties of Love waves are reviewed. A theoretical investigation of Love waves in magnetic substrates is discussed, and discovery of a unique non-reciprocal coupling between elastic and magnetostatic surface waves is described. Development of a thin-film surface-wave transducer of general utility at UHF frequencies is described. (Author)
AD-698 193 HC$3.00 MF$0.65

TABLES OF DIELECTRIC DISPERSION DATA FOR PURE LIQUIDS AND DILUTE SOLUTIONS,
National Bureau of Standards, Washington, D.C.
For primary bibliographic entry see Field 7D.
NBS-Circ-589 HC$0.50 MF$0.65

SUPERCONDUCTIVE 7.2- TESLA FOUR-MAGNET ASSEMBLY SUMMARY REPORT.
Radio Corp. of America, Harrison, N. J. Electronic Components.
R. Del Grosso, and E. R. Schrader. Oct 69, 77p
NASA-CR-1474
Contract NAS3-7928
Coll- 77 P Refs

Descriptors: *Niobium stannides, *Performance tests, *Structural design, *Superconducting magnets, Assemblies, Magnetic fields, Systems engineering.

For abstract, see STAR 07 24.
N69-40196 HC$3.00 MF$0.65

SOME QUESTIONS ON THE THEORY OF POTENTIAL VARIATION OF ELECTRODE LAYERS.
Nekotoryye Voprosy Teorii Prielektrodnogo Sloya Izmeneniya Potentiala
Techtran Corp., Glen Burnie, Md.
G. A. Lyubimov. Oct 69, 10p NASA-TT-F-12531
Contract NASW-1695
Coll- 10 P Tran- Transl. Into English From Zh. Prik. Mekhan. I Techn. Fiz. (Moscow), No. 4, 1964 P 10-15

Descriptors: *Electrodes, *Layers, *Potential theory, *Variations, Debye length, Electrons, Ionization, Magnetohydrodynamics.

For abstract, see STAR 07 24.
N69-40332 HC$3.00 MF$0.65

CORRELATIONS IN ISING FERROMAGNETS.
Laboratoire de Physique Theorique Et des Hautes Energies, Orsay (France).
J. Ginibre. 1969, 26p REPT-69/50
Conf- Presented At Cargese Summer School in Statist. Mech., July 1969

Descriptors: *Correlation, *Ferromagnetism, *Inequalities, *Mathematical models, *Statistical mechanics, Fourier transformation, Independent variables, Numerical analysis, Quantum theory.

For abstract, see STAR 07 24.
N69-41153 HC$3.00 MF$0.65

KINETICS OF A SPARK BY THE LIGHT OF AN OPTICAL QUANTUM GENERATOR (LASER) ON THE SURFACE OF DIELECTRICS (Kinetika Iskry, Vozbuzhdaemoi Svetom O.K.G. na Poverkhnosti Dielektrikov),
Sandia Labs., Albuquerque, N. Mex.
A. P. Veduta, and E. A. Sviridenkov. 4 Dec 69, 4p SC-T-69-1057
Trans. of Zhurnal Prikladnoi Spektroskopii (USSR) v6 p256-257 1967, by Marcel I. Weinreich.

Descriptors: (*Dielectrics, *Sparks), Lasers, Illumination, Luminescence, USSR.

A light flash was detected on the dielectric surface under irradiation by the laser light. Its kinetics were studied and different mechanisms of its excitation are discussed. (Author)
PB-188 184T HC$3.00 MF$0.65

TABLE OF DIELECTRIC CONSTANTS OF PURE LIQUIDS.
National Bureau of Standards, Washington, D.C.
For primary bibliographic entry see Field 7D.
PB-188 203 HC$3.00 MF$0.65

20D. Fluid Mechanics

EFFECT OF AIRFOIL SHAPE ON THE AERODYNAMIC CHARACTERISTICS OF A WING NEAR A GROUND-PLATE SURFACE.
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
For primary bibliographic entry see Field 1C.
AD-697 900 HC$3.00 MF$0.65

LARGE CIRCULATING DROPS IN VERTICAL TUBES.
Technical memo.,
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
V. O'Brien. Sep 69, 87p Rept no. APL-TG-1084
Contract NOw-62-0604

Descriptors: (*Drops, Interfaces), Pipes, Buoyancy, Reynolds number, Gravity, Viscosity, Bubbles, Capillary tubes, Fluid dynamic properties.
Identifiers: Bond number.

Large drops falling or rising within vertical tubes containing other fluids are studied experimentally and theoretically. For an ideal nonresistive interface the roles of Bond number, Reynolds number, and a 'gravity-viscous number', along with density ratio and viscosity ratio, in determining the velocity, shape, and circulation of the drops are described. Dynamic theoretical relationships are derived and used to correlate available data. Discussions on the static shape and the critical Bond number are included for completeness. Many drop-fluid systems do not behave as if the interface were ideal. The buoyancy-driven drop within a vertical tube is suggested as a tractable physical system to study such interfaces. (Author)
AD-697 907 HC$3.00 MF$0.65

VELOCITY PROFILE, SKIN-FRICTION BALANCE AND HEAT-TRANSFER MEASUREMENTS OF THE TURBULENT BOUNDARY LAYER AT MACH 5 AND ZERO-PRESSURE GRADIENT.
Final rept.,
Naval Ordnance Lab White Oak Md
Roland E. Lee, William J. Yanta, and Annette C. Leonas. 16 Jun 69, 87p* Rept no. NOLTR-69-106

Descriptors: (*Turbulent boundary layer, *Skin friction), Test methods, Velocity, Heat transfer, Hypersonic characteristics, Pressure, Compressible flow, Two-dimensional flow, Reynolds number, Tables.

The results of a detailed experimental investigation of a two-dimensional turbulent boundary layer at zero-pressure gradient are presented. The studies were made at the free-stream Mach number of 5, momentum-thickness Reynolds number from 4800 to 56,000 and wall-to-adiabatic-wall temperature ratios from 0.5 to 1.0. The data are in analytical terms of velocity profile, temperature profile, law-of-the-wall, velocity-defect law and incompressible form factor. Comparisons of local skin-friction coefficients obtained by four different experimental methods are shown. An empirical equation was derived from the shear-balance data to calculate the friction coefficient from known values of Mach number, heat transfer and Reynolds number. (Author)
AD-697 929 HC$3.00 MF$0.65

STABILITY THEORY FOR A PAIR OF TRAILING VORTICES,
Boeing Scientific Research Labs Seattle Wash Flight Sciences Lab

S. C. Crow. Sep 69, 42p Rept no. D1-82-0918

Descriptors: (*Vortices, Stability), Theory, Velocity, Flow separation, Wings, Trailing edge.

Trailing vortices do not decay by simple diffusion. Usually they undergo a symmetric and nearly sinusoidal instability, until eventually they join at intervals to form a train of vortex rings. The theory accounts for the instability during the early stages of its growth. The vortices are idealized as interacting lines; their core diameters are taken into account by a cut-off in the line integral representing self-induction. The equation relating induced velocity to vortex displacement gives rise to an eigenvalue problem for the growth rate of sinusoidal perturbations. Stability is found to depend on the products of vortex separation (b) and cut-off distance (d) times the perturbation wavenumber. Depending on those products, both symmetric and antisymmetric eigenmodes can be unstable, but only the symmetric mode involves strongly interacting long waves. An argument is presented that d/b= 0.07 for the vortices trailing from an elliptically loaded wing. (Author)
AD-697 950 HC$3.00 MF$0.65

MINIMUM ENERGY HYPERSONIC NOSE AND LEADING EDGE SHAPES,
Naval Ship Research and Development Center Washington D C Aerodynamics Lab
Roger J. Furey. Sep 69, 52p Rept no. Aero-1164 NSRDC-3186

Descriptors: (*Aerodynamic configurations, *Nose cones), (*Leading edge, Hypersonic characteristics), Reentry vehicles, Differential equations, Optimization, Numerical analysis, Heat transfer, Axially symmetric flow, Two-dimensional flow, Drag, Wedges.
Identifiers: Pontryagin maximum principle.

A system of first-order differential equations governing the heat transfer (convection and shock layer radiation) and pressure drag of an axisymmetric or two-dimensional body in hypersonic flow is developed. The Pontryagin maximum principle is applied to this system, through the gradient method, and a series of optimum hypersonic nose and two-dimensional shapes of given fineness ratio is found. The axisymmetric minimum drag shape is similar to the familiar 3/4 power law profile while the two-dimensional result is wedge shaped. The minimum heat transfer profiles are found to be flat faced when considering convection alone and conical, with a cusped tip, when considering radiation alone. Minimum energy shapes are found wherein the various energy terms being minimized include the sum of convection plus drag work, convection plus radiation plus drag work and convection plus radiation. The axisymmetric results show reasonable accomodation for the various energy forms considered in each of the minimum energy nose shapes. The two-dimensional minimum energy shapes are found to be dominated by the drag work with the results being, for all practical purposes, wedge shaped. (Author)
AD-697 951 HC$3.00 MF$0.65

TWO-DIMENSIONAL POTENTIAL FLOW THEORY FOR MULTIPLE BODIES IN SMALL-AMPLITUDE MOTION,
Mcdonnell Douglas Corp Long Beach Calif Douglas Aircraft Div
Joseph P. Giesing. 30 Apr 69, 149p Rept no. DAC-67028-Vol-2
Contract Nonr-4308 (00)
See also Volume 1, AD-682 549.

Descriptors: (*Airfoils, Two-dimensional flow), Potential theory, Vibration, Frequency, Computer programs.
Identifiers: Streamlines.

A method was developed for calculating the two-dimensional potential flow about two foils of arbitrary shape and at arbitrary incidence undergoing small-amplitude simple-harmonic motions. The two foils may be vibrating at two different frequencies. The computer program described (67MA) also can calculate steady streamlines as an option. Program 67MA is an extension of Program 22Y. (Author)
AD-697 969 HC$3.00 MF$0.65

ACCURACY OF DIFFERENTIAL APPROXIMATION FOR RADIATIVE IONIZATION IN COLD PRECURSOR OF AXISYMMETRIC DETACHED SHOCK,
Brown Univ Providence R I Div of Engineering
For primary bibliographic entry see Field 20I.
AD-697 974 HC$3.00 MF$0.65

ANALYTICAL SIMULATION OF THE THREE-DIMENSIONAL FLOW-FIELD ABOUT A SHIP.
Michigan State Univ East Lansing Div of Engineering Research
For primary bibliographic entry see Field 13J.
AD-697 989 HC$3.00 MF$0.65

FLUID DYNAMIC ASPECTS OF UNSTEADY FLOW IN BRANCHED DUCTS,
Saskatchewan Univ Saskatoon Dept of Mechanical Engineering
B. E. L. Deckker, and D. H. Male. 27 Sep 67, 8p
DRB-Reprint-2995
Availability: Pub. in Proceedings of the Institution of Mechanical Engineers, v182 pt3H p167-174 1967-1968. Paper 18. No copies furnished.

Descriptors: (*Ducts, *Fluid flow), Fluid dynamic properties, Stability, Pipes, Stagnation point, Pressure, Distribution, Flow visualization, Canada.
Identifiers: Unsteady flow.

Unsteady flow through three-branched pipe configurations was investigated with the object of finding boundary conditions suitable for use in the analysis of high-amplitude waves using the method of characteristics. The schlieren method and the hydraulic analogy were used to obtain qualitative information about the quasi-steady flow patterns. Quantitative information concerning these patterns was obtained by the measurement of stagnation pressure losses and of the static pressure distribution. Several methods of deriving boundary conditions were reviewed, and it is considered that those obtained directly by experiment are the most convenient to use. (Author)
AD-698 049

PROGRESS REPORT NO. 42 ON COMPUTING AND APPLIED MATHEMATICS FOR THE HALF YEAR JANUARY 1-JUNE 30, 1969. TECHNICAL SUMMARY FOR TASK I AND V ALSO ADMINISTRATIVE AND FINANCIAL SUMMARY FOR ENTIRE CONTRACT.
New York Univ., N.Y. AEC Computing and Applied Mathematics Center.
For primary bibliographic entry see Field 12A.
For abstract, see NSA 23 23.
NYO-1480-122 HC$3.00 MF$0.65

THE EXPERIMENTAL AND THEORETICAL DETERMINATION OF THE ELASTIC CHARACTERISTICS OF MODERN AIRFRAMES,
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 1C.
N63-86348 HC$3.00 MF$0.65

THE CALCULATION OF THE FLUCTUATING LIFT ON A CIRCULAR CYLINDER AND ITS APPLICATION TO THE DETERMINATION OF AEOLIAN TONE INTENSITY,
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 1A.
N64-16539 HC$3.00 MF$0.65

MEASUREMENTS OF FLUCTUATING 'STATIC' AND TOTAL-HEAD PRESSURE IN A TURBULENT WAKE,
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 1A.
N64-18717 HC$3.00 MF$0.65

THE PHYSICAL PICTURE OF FLOW NOISE,
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 20A.
N64-18991 HC$3.00 MF$0.65

SUPERSONIC LIFTING CAPABILITIES OF LARGE-ANGLE CONES.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
J. F. Campbell, and D. T. Howell. Oct 69, 66p
NASA-TN-D-5499
Contract 124-07-23-04-23

Descriptors: *Ablative nose cones, *Aerodynamic characteristics, *Angles (geometry), *Lifting bodies, *Supersonic flight, Atmospheric entry, Displacement, Graphs (charts), Mach number, Wind tunnel models.

For abstract, see STAR 07 24.
N69-40026 HC$3.00 MF$0.65

CHEMICALLY REACTING COUETTE FLOW WITH HYDROGEN INJECTION FOR TWO DIFFUSION MODELS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
R. A. Graves, Jr.. Jun 69, 104p NASA-TM-X-61899

Descriptors: *Chemical reactions, *Diffusion theory, *Gas injection, *Hydrogen, *Mathematical models, *Transport properties, Couette flow, Ficks equation, Graphs (charts), Mechanical engineering.

For abstract, see STAR 07 24.
N69-40028 HC$3.00 MF$0.65

DEVELOPMENT OF A SKIN-FRICTION BALANCE TO INVESTIGATE SOURCES OF ERROR IN DIRECT SKIN- FRICTION MEASUREMENTS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
J. G. Fowke. Jun 69, 72p NASA-TM-X-61905

Descriptors: *Drag measurement, *Skin friction, *Wind tunnels, Aerodynamic drag, Electronic transducers, Fluid flow, Pressure sensors, Wall flow.

For abstract, see STAR 07 24.
N69-40054 HC$3.00 MF$0.65

EFFECTS OF THREE OUTLET-ANNULUS AREA BLOCKAGE CONFIGURATIONS ON THE PERFORMANCE OF A 20-INCH (50.8-CM) AXIAL-FLOW COMPRESSOR ROTOR.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
G. W. Lewis, Jr., and W. M. Osborn. Oct 69, 24p
NASA-TN-D-5506
Contract 720-03

Descriptors: *Axial flow, *Blocking, *Compressor rotors, *Performance tests, High temperature, Rotating stalls, Torque.

For abstract, see STAR 07 24.
N69-40078 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF FLUTTER AT MACH 3 OF ROTATIONALLY

RESTRAINED PANELS AND COMPARISON WITH THEORY.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
C. P. Shore. Oct 69, 33p NASA-TN-D-5508
Contract 126-14-14-06-23

Descriptors: *Comparison, *Panel flutter, *Rectangular panels, *Theories, Buckling, Damping, Frequencies, Mach number.

For abstract, see STAR 07 24.
N69-40087 HC$3.00 MF$0.65

AN ANALYTICAL METHOD FOR PREDICTING THE LIFT AND DRAG FOR SLENDER SHARP-EDGE DELTA WINGS IN GROUND PROXIMITY.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
C. H. Fox, Jr. Mar 69, 55p NASA-TM-X-61903

Descriptors: *Delta wings, *Force distribution, *Lift drag ratio, *Slender wings, Aerodynamic balance, Potential flow, Thin wings, Vortices, Wing flow method tests.

For abstract, see STAR 07 24.
N69-40100 HC$3.00 MF$0.65

CHARACTERISTICS OF THE STATIC AND FLUCTUATING PRESSURE ENVIRONMENTS INDUCED BY THREE- DIMENSIONAL PROTUBERANCES AT TRANSONIC MACH NUMBERS.
Wyle Labs., Inc., Huntsville, Ala. Research Div.
J. E. Robertson. Jun 69, 255p NASA-CR-102269, WR-69-3
Contract NAS8-21026

Descriptors: *Cylindrical shells, *Flow distribution, *Transonic wind tunnels, *Turbulent flow, Flow characteristics, Mach number, Shell theory, Three dimensional boundary layer.

For abstract, see STAR 07 24.
N69-40127 HC$3.00 MF$0.65

EXPERIMENTAL EVALUATION OF TRANSONIC STATORS FINAL REPORT.
Pratt and Whitney Aircraft, East Hartford, Conn.
J. A. Bartok, and M. J. Keenan. 1969, 96p NASA-CR-72298, PWA-3470
Contract NAS3-7614

Descriptors: *Performance tests, *Stator blades, *Transonic compressors, Compressor efficiency, Compressor rotors, Pressure drop.

For abstract, see STAR 07 24.
N69-40129 HC$3.00 MF$0.65

FLUCTUATING PROPERTIES OF TURBULENT BOUNDARY LAYERS FOR MACH NUMBERS UP TO 9.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
I. E. Beckwith, D. M. Bushnell, and W. D. Harvey. 5 Oct 69, 51p NASA-TN-D-5496
Contract 124-07-18-02-23

Descriptors: *Mach number, *Turbulent boundary layer, *Variations, *Velocity, Density (mass/volume), Shock tunnels, Temperature.

For abstract, see STAR 07 24.
N69-40137 HC$3.00 MF$0.65

THEORETICAL STUDY OF VORTEX SHEDDING FROM BODIES OF REVOLUTION UNDERGOING CONING MOTION.
Nielsen Engineering and Research, Inc., Palo Alto, Calif.
G. D. Kuhn, J. N. Nielsen, and S. B. Spangler. 5 Nov 69, 61p NASA-CR-1448, NEAR-TR-14
Contract NAS2-4765
Coll- 61 P Refs

Descriptors: *Mathematical models, *Slender bodies, *Turbulent flow, *Vortex generators, Bodies of revolution, Cones, Equations of motion, Flow distortion, Fluid dynamics, Vortices, Vorticity equations.

For abstract, see STAR 07 24.
N69-40200 HC$3.00 MF$0.65

AN EXPERIMENTAL INVESTIGATION ON UNIT REYNOLDS NUMBER AND BLUNTNESS EFFECTS ON BOUNDARY-LAYER TRANSITION FOR A 10 DEG HALF- ANGLE CONE AT M INFINITY EQUALS 7.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
M. C. Fischer. Jun 69, 100p NASA-TM-X-61906

Descriptors: *Boundary layer transition, *Ellipticity, *Half cones, *Hypersonic flow, *Reynolds number, Blunt bodies, Nose cones.

For abstract, see STAR 07 24.
N69-40204 HC$3.00 MF$0.65

EFFECTS OF PRESSURE DISTRIBUTION ON THE SHAPE OF TENSION SHELL ENTRY VEHICLES.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
For primary bibliographic entry see Field 20K.
For abstract, see STAR 07 24.
N69-40219 HC$3.00 MF$0.65

A STUDY OF FLUID DYNAMICS OF GASEOUS NUCLEAR ROCKETS QUARTERLY PROGRESS REPORT, 1 JUL. - 30 SEP. 1969.
Massachusetts Inst. of Tech., Cambridge.
1 Oct 69, 19p NASA-CR-106310, QPR-6
Contract NSR-22-009-288

Descriptors: *Data correlation, *Nuclear propulsion, *Performance prediction, *Vortices, Fluid dynamics, Gaseous rocket propellants.

For abstract, see STAR 07 24.
N69-40323 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION ON THE ORIGIN OF TURBULENT TUBULAR FLOW.
Experimentelle Untersuchungen Ueber Die Entstehung Der Turbulenten Rohrstrogmung
Techtran Corp., Glen Burnie, Md.
A. Naumann. Oct 69, 27p NASA-TT-F-12615
Contract NASW-1695
Coll- 27 P Refs Tran- Transl. Into English From Z. Techn. Mech. Und Thermodyn. (Ger.), V. 2, No. 3, Mar. 1931 P 85-98

Descriptors: *Pipes (tubes), *Reynolds number, *Turbulent flow, Flow velocity, Kinematics, Laminar flow, Vortex streets.

For abstract, see STAR 07 24.
N69-40330 HC$3.00 MF$0.65

WIND-TUNNEL INVESTIGATION OF THE AERODYNAMIC PRESSURES ON THE APOLLO COMMAND MODULE CONFIGURATION.
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
W. C. Moseley, Jr., and B. J. Wells. Oct 69, 76p NASA-TN-D-5514
Contract 914-50-10-03-72

Descriptors: *Aerodynamic coefficients, *Apollo spacecraft, *Command modules, *Wind tunnel models, Angle of attack, Orifices, Test facilities.

For abstract, see STAR 07 24.
N69-40345 HC$3.00 MF$0.65

A METHOD OF INTEGRAL RELATIONS SOLUTION FOR RADIATING, NONADIABATIC, INVISCID FLOW OVER A BLUNT BODY.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
J. T. Suttles. Oct 69, 60p NASA-TN-D-5480
Contract 124-07-18-01-23

Descriptors: *Blunt bodies, *Fluid flow, *Integral equations, *Inviscid flow, *Radiative heat transfer, Adiabatic conditions, Approximation, Heat flux, Reentry vehicles, Stagnation point.

For abstract, see STAR 07 24.
N69-40356 HC$3.00 MF$0.65

NON-EQUILIBRIUM TRANSONIC FLOW PAST SLENDER BODIES.
National Aeronautical Lab., Bangalore (India).
K. N. Murthy, and N. R. Subramanian. Jul 68, 19p NAL-TN-12

Descriptors: *Airfoils, *Disturbances, *Transonic flow, Fourier transformation, Linear systems, Mach number.

For abstract, see STAR 07 24.
N69-40395 HC$3.00 MF$0.65

CALCULATION OF THE PERFORMANCES OF A SUPERCAVITATING PROPELLER (SIGMA EQUALS 0.4) FOR DIFFERENT ADVANCE COEFFICIENTS (J) - CONFRONTATION, THEORY, EXPERIMENT FINAL SCIENTIFIC REPORT.
Compagnie de Recherches Et D Etudes Aeronautiques, Paris (France).
For primary bibliographic entry see Field 13J.
For abstract, see STAR 07 24.
N69-40425 HC$3.00 MF$0.65

INVESTIGATIONS OF UNIFORM AND SUSPENSION- CARRYING TURBULENT FLOWS.
Akademiya Nauk Ursr, Kiev.
1967, 119P
Lang- in Russian

Descriptors: *Channel flow, *Dispersions, *Flow velocity, *Pipe flow, *Turbulence effects, *Two phase flow, Equations of motion, Erosion, Semiempirical equations, Transport properties, Turbulent flow, Uniform flow.

For abstract, see STAR 07 24.
N69-40626 HC$3.00 MF$0.65

BOUNDARY LAYER PROBLEMS IN AXIAL TURBOMACHINES.
Cambridge Univ. (England). Dept. of Engineering.
J. H. Horlock. 1969, 66p CUED/A-TURBO/TR-1

Descriptors: *Axial flow turbines, *Laminar boundary layer, *Problem solving, *Turbulent boundary layer, Axisymmetric flow, Centrifugal force, Coriolis effect, Three dimensional boundary layer, Turbomachine blades.

For abstract, see STAR 07 24.
N69-40715 HC$3.00 MF$0.65

CONVECTIVE HEAT-TRANSFER RATES ON LARGE-ANGLE CONICAL BODIES AT HYPERSONIC SPEEDS.
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
For primary bibliographic entry see Field 20M.
For abstract, see STAR 07 24.
N69-40780 HC$3.00 MF$0.65

SHOCK WAVES IN REAL GASES.
National Aeronautics and Space Administration, Washington, D. C.
T. V. Bazhenova. Oct 69, 187p NASA-TT-F-585

Tran- Transl. Into English of the Book "udarnyye Volny V Realnykh Gazakh" Moscow, Nauka Press, 1968 P 15-195

Descriptors: *Real gases, *Shock waves, *Wave propagation, Detonation, Excitation, Ionization, Shock tubes, U.S.S.R., Wave fronts.

For abstract, see STAR 07 24.
N69-40824 HC$3.00 MF$0.65

ANALYSIS OF THE MIXING REGION FOR A TWO- DIMENSIONAL JET INJECTED AT AN ANGLE TO A MOVING STREAM.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
W. Braun, and M. E. Goldstein. Nov 69, 25p
NASA-TN-D-5531, E-5163
Contract 129-01

Descriptors: *Boundary layer separation, *Fluid injection, *Inviscid flow, *Laminar mixing, *Numerical analysis, *Turbulent mixing, Orifice flow, Velocity distribution.

For abstract, see STAR 07 24.
N69-41213 HC$3.00 MF$0.65

IMPACT AND CAVITATION EROSION AND MATERIAL MECHANICAL PROPERTIES,
Michigan Univ., Ann Arbor. Cavitation and Multiphase Flow Lab.
For primary bibliographic entry see Field 20K.
PB-188 016 HC$3.00 MF$0.65

THE DESIGN AND TESTING OF A NARROW CHANNEL LAMINAR FLOW HEMODIAFILTER (THE DIAPHRON).
Amicon Corp., Lexington, Mass.
For primary bibliographic entry see Field 6L.
PB-188 156 HC$3.00 MF$0.65

HEAT AND MASS TRANSFER IN DISPERSED, TWO-PHASE, SINGLE-COMPONENT FLOW,
Colorado Univ., Boulder.
K. D. Timmerhaus, F. Kreith, A. U. Simpson, and M. C. Jones. 2 Jan 69, 15p NBS-R-542
Revision of Report dated 19 Aug 68. Pub. in International Jnl. of Heat Mass Transfer, v12 n9 p1141-1155 Sep 69. Prepared in cooperation with Garrett Corp., Los Angeles, Calif., AiResearch Mfg. Div.

Descriptors: (*Two-phase flow, *Heat transfer), (*Mass transfer, Two-phase flow), Scattering, Particles, Vapors, Laminar boundary layer, Pipes.

The process of heat transfer to a two-phase mixture of well-dispersed subliming particles and vapor, flowing over a heated surface, is analyzed. It is shown by a laminar boundary layer analysis that, when the surface-area per unit volume of the particle (or solid) phase is large enough, the phase change dominates the heat-transfer process and hastens the development of the thermal boundary layer. Under these conditions, the thermal boundary-layer thickness not only becomes uniform a short distance downstream from the starting point, but also is substantially less than it would be were the particle phase absent. For such systems, the equations describing the heat-transfer process can be considerably simplified and, if the physical properties of both phases are uniform, a remarkably simple solution results. For systems in which the physical properties are not uniform, a solution involving integration across the boundary layer is developed. The solutions are applicable to developing, as well as fully developed, laminar boundary layers over a flat plate; the solutions also approximate conditions in flow through a tube, provided that the tube radius is large compared to the thermal boundary-layer thickness. The predictions of this theoretical analysis agree satisfactorily with experimental results. With slight modification, the same approach may possibly be applicable for turbulent flow in the boundary layer. (Author)
PB-188 212

CRYOGENIC FLOW RESEARCH FACILITY OF THE NATIONAL BUREAU OF STANDARDS,
National Bureau of Standards, Boulder, Colo. Inst. for Basic Standards.
For primary bibliographic entry see Field 14B.
PB-188 215

TWO-PHASE (LIQUID-VAPOR), MASS-LIMITING FLOW WITH HYDROGEN AND NITROGEN. (G-6),
National Bureau of Standards, Boulder, Colo. Inst. for Basic Standards.
J. A. Brennan, D. K. Edmonds, and R. V. Smith. 1968, 5p R-532
Pub. in Advances in Cryogenic Engineering, v14 p294-298. Proceedings of the Cryogenic Engineering Conference, Cleveland, Ohio, 19-21 Aug 68.

Descriptors: (*Two-phase flow, *Hydrogen), (*Nitrogen, Two-phase flow), Liquefied gases, Vapors, Incompressible flow, Mathematical models, Cryogenics.
Identifiers: Choking flow.

Experimental data are presented for choking, two-phase flow of hydrogen and nitrogen. The general behavior of this flow may be described by the use of simple analytical models as is the case of more conventional fluids. Except at low quality flow, the use of models provides upper and lower limits for choking flow of hydrogen and nitrogen in liquid-vapor mixtures. Further detailed analytical and experimental work would be required to provide a more accurate predictive system for such flow. (Author)
PB-188 216 HC$3.00 MF$0.65

CAVITATION IN LIQUID CRYOGENS. (G-4),
National Bureau of Standards, Boulder, Colo. Inst. for Basic Standards.
D. K. Edmonds, and J. Hord. 1968, 9p R-531
Pub. in Advances in Cryogenic Engineering, v14 p274-282. Proceedings of the Cryogenic Engineering Conference, Cleveland, Ohio, 19-21 Aug 68.

Descriptors: (*Liquefied gases, Cavitation), (*Cavitation, *Cryogenics), Hydrogen, Nitrogen, Pressure, Temperature, Numerical analysis.

Some characteristic data for developed cavitation in both hydrogen and nitrogen are given in the form of pressure-depression curves. These curves show that the pressure and temperature in the cavity are generally not in thermodynamic equilibrium. Recent data are used to analyze and evaluate the basic similarity-equation theory and to compare these results with the experimental work of others; the cavity thickness ratio is assumed to be unity. An analytical method, to account for variations in cavity thickness, is proposed and evaluated using the experimental hydrogen data; the results are again compared with the experimental work of others. The proposed method holds some promise for improvement of the cavitation similarity equation. (Author)
PB-188 217 HC$3.00 MF$0.65

20E. Masers and Lasers

EFFECT OF SPATIAL COHERENCE OF PRIMARY EMISSION ON INTENSITY OF THE HARMONIC,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20F.
AD-697 894 HC$3.00 MF$0.65

STUDIES OF LOW DENSITY PLASMAS WITH GAS LASERS.
Illinois Univ Urbana Gaseous Electronics Lab
For primary bibliographic entry see Field 20I.
AD-697 997 HC$3.00 MF$0.65

CONSTRUCTION AND EVALUATION OF THIN FILM BEAM DIVIDERS.
Ballistic Research Labs Aberdeen Proving Ground Md
For primary bibliographic entry see Field 20F.
AD-698 025 HC$3.00 MF$0.65

ACADEMY OF SCIENCES OF THE BELORUSSIAN SSR. REPORTS. VOLUME 12, NUMBER 9, 1968 (SELECTED ARTICLES),
Foreign Technology Div Wright-Patterson AFB Ohio
A. M. Samson, A. N. Rubinov, and T. I. Smolskaya. 8 Sep 69, 21p Rept no. FTD-HT-23-477-69
Edited trans. of Akademiya Navuk BSSR, Minsk. Doklady, v12 n9 p773-775, 781-785 1968, by D. Koolbeck.

Descriptors: (*Lasers, Operation), Optical filters, Reflection, Ruby, Mirrors, USSR.
Identifiers: Translations, Ruby lasers.

Contents: Calculation of internal reflections during analysis of the properties of a laser with a bleachable filter; and Experimental determination of energy parameters of a ruby generator.
AD-698 116 HC$3.00 MF$0.65

INFRARED DETECTORS, LASER TECHNOLOGY AND SIGNAL PROCESSING.
Annual rept. no. 2, 1 Sep 68-30 Aug 69,
Minnesota Univ Minneapolis Dept of Electrical Engineering
R. J. Collins. 30 Sep 69, 120p
Contract N00014-68-A-0141-0002

Descriptors: (*Gas lasers, Carbon dioxide), (*Infrared detectors, *Photocathodes), Signals, Information theory, Raman spectroscopy, Noise (Radio), Gain, Microwaves.
Identifiers: Carbon dioxide lasers, Signal processing.

Contents: Photoelectric detection; Radian gain profiles in a CO2 amplifier; CO2 laser plasma studies; Raman scattering; Signal processing; Noise in optical detection; and Semiconductor noise investigations using microwaves. Major strides have been made in the area of the understanding of the failure mode of sealed CO2 lasers, in the understanding of photocathode formation process and the measurement of gain profiles in CO2 laser tubes.
AD-698 153 HC$3.00 MF$0.65

OPTICAL PUMPS FOR LASERS. PHASE II.
Quarterly progress rept. no. 1, 1 Apr-30 Jun 66,
Westinghouse Research Labs., Pittsburgh, Pa.
Charles H. Church, D. A. Larson, and I. Liberman. Sep 66, 52p ECOM-02097-1
Contract DA-28-043-AMC-02097 (E)
Distribution Limitation now Removed.

Descriptors: (*Flash lamps, Pumping (Optical)), (*Pumping (Optical), *Lasers), Mercury lamps, Sodium, Incandescent lamps, Garnet, Neodymium.
Identifiers: Neodymium glass lasers.

The work consisted of the construction and testing of a number of Na-Hg lamps in a polycrystalline aluminum (PCA) envelope. The observed parameters of interest were the lumens/watt and the spectral wavelengths radiated. These parameters were varied by changing the quantities of Na and Hg as well as the noble filler gas. In addition, an oven varied the temperature of the Na-Hg reservoir and the input electrical power was also varied. Some lifetime testing of the lamp in an open, non-reflecting geometry was also done. The effort at the Research Laboratories was in the constructing of the test laser head. The optical bench mounted head consists of a six inch diameter spherical cavity, a liquid cooled laser rod assembly, an adjustable lamp and rod holder assembly and adjustable external mirror resonators. The laser head was tested using a tungsten-iodine lamp as a pump. Although many parameters were not optimized, an overall slope efficiency of .7% was obtained with 2.6 watts out at 1060 watts into the pump.
AD-801 249 HC$3.00 MF$0.65

OPTICAL PUMPS FOR LASERS - PHASE II.
Quarterly progress rept. no. 2, 1 Jul-30 Sep 66,
Westinghouse Research Labs., Pittsburgh, Pa.
C. H. Church, D. A. Larson, I. Liberman, and R. G. Young. Dec 66, 76p 67-9C1-LHICW-R1
Contract DA-28-043-AMC-02097 (E)
Distribution Limitation now Removed. See also Quarterly progress rept. no. 3, AD-812 044.

Descriptors: (*Lasers, *Pumping (Optical)), Mercury lamps, Sodium, Absorption spectrum, Garnet, Sapphires.

A large number of sodium additive lamps were made and tested. Tests include electrical and spectral characteristics as well as some life testing. Data on three Na-Hg lamps in sapphire envelopes, three Na-Hg lamps in PCA envelopes, and eleven NaI-Hg lamps in quartz envelopes are included. High resolution spectra of the emission of the sodium additive lamp were taken and compared with the same spectra with an Nd:YAG spectroscopic sample placed in front of the monochromator entrance slit. Thus, a direct measurement of spectral match could be made. A computer program was developed enabling one to transfer the curve of spectral absorption of Nd:YAG into the computer so that spectral match calculations could be made if the emission spectrum of a lamp is known. A threshold measurement of an NaI-Hg lamp pumping a 3 x 30 mm Nd:Cr:YAG rod was made. Threshold was 332 watts which compares with 540 watts for a tungsten filament lamp operating under similar conditions. (Author)
AD-811 564 HC$3.00 MF$0.65

OPTICAL PUMPS FOR LASERS - PHASE II.
Quarterly progress rept. no. 3, 1 Oct 66-1 Jan 67,
Westinghouse Research Labs., Pittsburgh, Pa.
C. H. Church, D. A. Larson, I. Liberman, and R. G. Young. Mar 67, 82p 67-9C1-LHICW-R2 ECOM-02097-3
Contract DA-28-043-AMC-02097 (E)
See also Quarterly progress rept. no. 2, AD-811 564. Distribution Limitation now Removed.

Descriptors: (*Lasers, *Pumping (Optical)), Mercury lamps, Sodium, Sapphires, Garnet, Neodymium.

The work consisted of the construction and testing of lamps containing different ratios of Na-Hg amalgams in both PCA and sapphire envelopes and NaI+ Hg in quartz envelopes. High resolution spectra were obtained for many of the lamps to determine the effect of loading on the coincidence of the short wavelength wing peak and 5688A line with Nd:YAG absorption bands. Measurements with argon flow demonstrated that the position of the short wavelength wing peak could be readily shifted by adjusting the flow rate. The superior pumping ability of sodium additive lamps over tungsten filament lamps for cw operation of an Nd:YAG laser has been demonstrated. Further improvement of the additive lamps should be expected by using a square wave or high frequency AC power supply. In addition, operation of Na-Hg lamps at high density of Na and Hg provide a strong continuum in the 7000-8000A region which may prove more effective for pumping than the slightly broadened D lines. (Author)
AD-812 044 HC$3.00 MF$0.65

OPTICAL PUMPS FOR LASERS - PHASE II.
Quarterly progress rept. no. 4, 1 Jan-31 Mar 67,
Westinghouse Research Labs., Pittsburgh, Pa.
C. H. Church, D. A. Larson, I. Liberman, and R. G. Young. Jun 67, 92p 67-9C1-LHICW-R4 ECOM-02097-4
Contract DA-28-043-AMC-02097 (E)
Distribution Limitation now Removed. See also Quarterly progress rept. no. 3, AD-812 044 and Rept. no. ECOM-02097-5, AD-662 252.

Descriptors: (*Lasers, *Pumping (Optical)), Mercury lamps, Alkali metals, Garnet, Neodymium, Sapphires.

Lamps having either polycrystalline or single crystal Al203 (sapphire) bodies were made and studied spectroscopically. The lamps were filled with amalgams of mercury and either sodium, potassium, rubidium, or cesium. Quartz bodied lamps filled with sodium iodide and mercury were also made. The latter was also tested as a laser pump. Among the Al203 bodied lamps the K-Hg one appeared to be the most promising as a pump for Nd:YAG. From spectroscopic data it was about four times as efficient a radiator at the major absorption bonds of Nd:YAG compared to a tungsten lamp operating at its rated power level. (Author)
AD-817 202 HC$3.00 MF$0.65

LASER POWER AND ENERGY MEASUREMENTS.
Technical note,
National Bureau of Standards, Boulder, Colo. Radio Standards Physics Div.
D. A. Jennings, E. D. West, K. M. Evenson, A. L. Rasmussen, and W. R. Simmons. Oct 69, 72p
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.65.

Descriptors: (*Lasers, Calorimetry), Calorimeters, Energy, Power, Gas lasers, Measurement, Accuracy, Calibration, Photoelectric cells (Semiconductor), Power meters, Errors.
Identifiers: Laser energy, Laser power, Ruby lasers, Glass lasers, Carbon dioxide lasers, Data reduction.

Calorimeters for measuring the output energy of pulsed ruby and neodymium glass lasers have been built and calibrated. The absorbing medium is an aqueous solution of CuSO4. Calibration of laser energy detectors has an estimated uncertainty of plus or minus 2% for input energies of 0.1J to 100J. Instrumentation is described that is used for the calibration of cw laser power meters. The calibration unit employs an absorption cell calorimeter to calibrate the output of a photovoltaic cell transfer detector. The calibrations are within an accuracy of 4%. A discussion and description is also given of several types of calorimeters that have been used to measure the output of a 100 watt CO2 laser. The most recent design provides for measurement from 1 watt to 5 kilowatts with a measured accuracy of better than 3%. (Author)
NBS-TN-382 HC$0.65 MF$0.65

20F. Optics

EFFECT OF SPATIAL COHERENCE OF PRIMARY EMISSION ON INTENSITY OF THE HARMONIC,
Foreign Technology Div Wright-Patterson AFB Ohio
B. A. Sotskii. 5 Sep 69, 9p Rept no. FTD-HT-23-476-69
Edited trans. of Akademiya Navuk BSSR, Minsk. Doklady, v12 n10 p8ll8-891 1968, by D. Koolbeck.

Descriptors: (*Coherent radiation, Harmonic analysis), Nonlinear systems, Wave functions, Beams (Electromagnetic), Intensity, Tensor analysis, Mathematical models, Polarization, Lasers, USSR.
Identifiers: Coherence functions, Incidence, Translations.

Primary emission of a crystal is described as a certain given tensor first-order coherence function. The dependence of the harmonic is plotted as a function of the degree of coherence of incident radiation. The author states that their model is preferable to that given by Beran and Develis.
AD-697 894 HC$3.00 MF$0.65

CONSTRUCTION AND EVALUATION OF THIN FILM BEAM DIVIDERS.
Technical note,
Ballistic Research Labs Aberdeen Proving Ground Md
Lawrence J. Vande Kieft, Edgar A. Murray, William M. Frey, and Philip W. Yunker. Oct 69, 23p* Rept no. BRL-TN-1723

Descriptors: (*Lasers, Intensity), (*Optical materials, Films), Reflectors, Light transmission, Measurement, Coherent radiation, Optical properties, Performance (Engineering), Reliability, Power spectra, Optical instruments.
Identifiers: *Pellicles, Beam splitters, Power density distribution, Evaluation.

Available commercial beam dividers were not of adequate quality for diverting some laser power into a camera for the purpose of recording the power density distribution of an intense laser beam. A method was developed for constructing the required beam dividers from thin-film Mylar. These were found to be sturdy enough to withstand repeated application of very intense laser pulses, and they could be cleaned as required without being damaged. These beam dividers were evaluated both statically and dynamically for flatness and parallelism. In addition they were evaluated statically for uniformity, resistance to damage, and efficiency of light transmission. The dynamic tests were performed at the ruby wavelength of 6943 Angstroms and the static tests at 6328 Angstroms. (Author)
AD-698 025 HC$3.00 MF$0.65

FEASIBILITY OF APPLYING FIBER OPTICS IN LINEAR MEASUREMENTS BY TELEVISION METHODS,
Army Foreign Science and Technology Center Washington D C
V. A. Rabinovich, L. I. Zatoka, N. V. Zhuravleva, S. S. Safyulina, and L. I. Voronova. 23 Oct 69, 10p
Rept no. FSTC-HT-23-008-70
Trans. of Optiko-Mekhanicheskaya Promyshlennost (USSR) v35 n11 p4-7 1968.

Descriptors: (*Camera tubes, *Fiber optics), Digital systems, Television equipment, Measurement, USSR.
Identifiers: Translations.

Some possibilities of applying fiber optics in linear measurements by television are investigated. An example is presented of constructing a digital optical system the basic element of which is a fiber-optical encoding device. (Author)
AD-698 080 HC$3.00 MF$0.65

INFRARED DETECTORS, LASER TECHNOLOGY AND SIGNAL PROCESSING.
Minnesota Univ Minneapolis Dept of Electrical Engineering
For primary bibliographic entry see Field 20E.
AD-698 153 HC$3.00 MF$0.65

PROPERTIES OF MULTILAYER FILTERS INTERIM REPORT, 1 MAR. - 31 AUG. 1969.
Rochester Univ., N. Y. Inst. of Optics.
P. W. Baumeister. 31 Aug 69, 60p NASA-CR-106335
Contract NGL-33-019-003

Descriptors: *Bandpass filters, *Transmittance, *Ultraviolet spectra, *Wavelengths, Attenuation, Laminates, Optical thickness, Photometers.

For abstract, see STAR 07 24.
N69-40296 HC$3.00 MF$0.65

APOLLO 8 COLORIMETRY.
Bellcomm, Inc., Washington, D. C.
A. F. Goetz. 11 Mar 69, 10p NASA-CR-106458, TM-69-2015-3
Contract NASW-417

Descriptors: *Apollo 8 flight, *Colorimetry, *Data processing, *Lunar photography, High resolution, Images.

For abstract, see STAR 07 24.
N69-40799 HC$3.00 MF$0.65

METHOD AND EQUIPMENT FOR MAKING PREPARATIONS OF MICROSCOPIC PARTICLES OF SOLID SUBSTANCES (Zpusob a Zarizeni k Provedeni Pripravy Preparatu Mikroskopickych Castic Pevnych Latek),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 14B.
PB-188 150T HC$3.00 MF$0.65

20G. Particle Accelerators

PLACEMENT OF AN ELECTROSTATIC DEFLECTOR FOR THE SLOW EXTERNAL BEAM IN THE AGS,
Brookhaven National Lab., Upton, N.Y.
J. W. Glenn. 27 Aug 69, 13p

Descriptors: (*Synchrotrons, Particle accelerator components), (*Particle beams, Deflection), Electrostatic fields, Particle trajectories, Alternating gradient focusing accelerators.
Identifiers: *Alternating gradient synchrotron.

For abstract, see NSA 23 23.
BNL-13987 HC$3.00 MF$0.65

A REACTIVE TRAPPED-ION SOURCE FOR HIGHLY STRIPPED IONS,
Princeton Univ., N.J. Plasma Physics Lab.
Thomas H. Stix. Sep 69, 27p
Contract AT (30-1)-1238

Descriptors: (*Ion sources, Plasma medium), Transuranium elements, Ion bombardment.

For abstract, see NSA 23 23.
MATT-709 HC$3.00 MF$0.65

TRANSIENT PHENOMENA DURING ELECTRON BEAM INJECTION IN THE SACLAY 45 ME V ACCELERATOR.
Regimes Transitoires A l'Injection Du Faisceau D'electrons Dans l'Accelerateur 45 Mev de Saclay
Commissariat A L Energie Atomique, Saclay (France). Paris Univ., Orsay (France). Centre D Etudes Nucleaires.
M. Bolore, G. Filippi, J. Marcou, A. Papierwik, and L. Wartski. Jun 69, 65p CEA-R-3842
Lang- in French, English Summary Prep- Prepared Jointly With Paris Univ., Orsay

Descriptors: *Electron beams, *Ion injection, *Linear accelerators, *Transient oscillations, Energy spectra, Particle accelerators, Particle energy, Transient response, Ultrahigh frequencies.

For abstract, see STAR 07 24.
N69-40157 HC$3.00 MF$0.65

CALCULATIONS EVALUATING SEVERAL METHODS FOR REDUCING THE RESIDUAL PHOTON DOSE RATE AROUND HIGH-ENERGY PROTON ACCELERATORS.
Technical memo.,
Oak Ridge National Lab., Tenn.
T. W. Armstrong, and J. Barish. 10 Nov 69, 12p
ORNL-TM-2768

Descriptors: (*Proton accelerators, Dose rate), (*Dose rate, Reduction), Proton beams, Thermal neutrons, Concrete.

Calculations have been carried out to evaluate several methods for reducing the residual photon dose rate inside an accelerator tunnel due to the activation of the concrete tunnel walls by thermal neutrons from a 3-GeV proton beam located on the axis of an iron cylinder. The reduction of the thermal-neutron production of 24Na in the concrete, obtained by placing cadmium and boron at the surface of the concrete and by adding boron to the concrete, is calculated. The photon dose due to the activation of the concrete is combined with the results from a previous calculation for the dose contributed by the iron to obtain the total photon dose rate inside the tunnel. The calculations were carried out using Monte Carlo methods. (Author)
PB-188 101 HC$3.00 MF$0.65

THE PRINCETON-PENNSYLVANIA RAPID CYCLING, 3 GeV PROTON SYNCHROTRON: RECENT IMPROVEMENTS AND FUTURE PLANS,
Princeton-Pennsylvania Accelerator, Princeton, N.J.
J. L. Kirchgessner. 12 Aug 69, 14p CONF-690811-9
Contract AT (30-1)-3217
Presented at the International Conference on High Energy Accelerators, Moscow (USSR). 27 Aug-2 Sep 69.

Descriptors: (*Proton accelerators, *Synchrotrons), Operation, Particle accelerator components, Particle accelerator techniques.

For abstract, see NSA 23 23.
PPAD-662-E HC$3.00 MF$0.65

LINEAR ION ACCELERATOR WITH SPATIALLY UNIFORM HARD FOCUSING (Linenli Uskoritel Ionov s Prostranstvenno-Odnorodnoi Zhestkoi Fokusirovkoi),
Stanford Linear Accelerator Center, Calif.
I. M. Kapchinskii, and V. A. Teplyakov. Aug 69, 17p
Trans. of Institut Teoreticheskoi i Eksperimentalnoi Fiziki. Rapport (USSR) ITEP-673 16p Mar 69, by T. Watt.

Descriptors: (*Linear accelerators, Ion beams), Ion accelerators, Electromagnetic lenses, Design, USSR.
Identifiers: Translations.

For abstract, see NSA 23 23.
SLAC-Trans-99 HC$3.00 MF$0.65

ACCELERATING, IN A RESONATOR, A RELATIVISTIC BUNCH BEARING A LARGE CHARGE (Ob Uskorenii Relyativistskogo Sgustka s Bolshim Zaryadom v Rezonatore),
California Univ., Berkeley. Lawrence Radiation Lab.
S. B. Rubin, and V. N. Mamonov. Aug 69, 97p
Trans. of Joint Inst. for Nuclear Research, Dubna (USSR) JINR-P9-3346-2 39p 1967, by I. M. R. Jones.

Descriptors: (*Electron accelerators, Cavity resonators), Linear accelerators, Electromagnetic fields, Electron beams, Particle accelerator techniques, USSR.
Identifiers: *Bunching (Particle accelerators), Translations.

For abstract, see NSA 23 23.
UCRL-Trans-1400 HC$3.00 MF$0.65

20H. Particle Physics

ANALYSIS OF 17,898 POSITIVE TAU MESON+ DECAYS AT REST,
Stevens Inst of Tech Hoboken N J Dept of Physics
J. Grauman, E. L. Koller, S. Taylor, P. Stamer, and A. Kanofsky. 1969, 29p
Supported in part by National Science Foundation, Washington, D. C., and National Aeronautics and Space Administration, Washington, D. C. Prepared in cooperation with Seton Hall Univ., South Orange, N. J. Dept. of Physics, and Lehigh Univ., Bethlehem, Pa. Dept. of Physics.

Descriptors: (*K mesons, Decay schemes), Meson reactions, Pions, Particle spectra, Selection rules.

The energy spectrum of the decay pions in tau+ decay was obtained from a sample of 17,898 events. It is found that the spectrum is adequately fitted by a squared matrix element of linear form. No evidence for CP noninvariance is found for tau+ decays. A significant violation of the delta I= 1/2 rule is observed for K+ yields 3 pion decays. (Author)
AD-697 966 HC$3.00 MF$0.65

BETA DECAY OF Ne24,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
R. E. McDonald, J. A. Becker, A. D. W. Jones, and A. R. Poletti. 4 Nov 68, 3p
Sponsored in part by the Office of Naval Research, Washington, D. C.
Availability: Pub. in The Physical Review, v181 n4 p1631-1633, 20 May 69.

Descriptors: (*Neon, *Beta decay), Proton reactions, Tritons, Nuclear energy levels, Gamma-ray spectra, Selection rules.

The beta decay of Ne24 has been studied by observing the delayed gamma-ray spectrum with the aid of a Ge (Li) gamma-ray spectrometer. Ne24 was produced by the Ne22 (t, p)Ne24 reaction, at an incident bombarding energy of 2.5 MeV. (Author)
AD-698 046

LIFETIMES OF EXCITED STATES IN Ca40 BY THE DOPPLER-SHIFT ATTENUATION METHOD,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
A. R. Poletti, A. D. W. Jones, J. A. Becker, and R. E. McDonald. 13 Jan 69, 12p
Availability: Pub. in Physical Review, v181 n4 p1606-1617, 20 May 69. No copies furnished.

Descriptors: (*Calcium, Nuclear energy levels), Gamma-proton reactions, Nuclear spins, Life expectancy, Excitation, Parity, Doppler effect.

Lifetimes of levels in Ca40 below an excitation energy of 6.3 MeV have been studied through the Ca40 reaction. (Author)
AD-698 052

STUDY OF THE LOW-LYING EXCITED STATES OF Al29. I. Si30 (t, alpha)Al29,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
A. D. W. Jones. 15 Nov 68, 10p
Availability: Pub. in Physical Review, v180 n4 p997-1006, 20 Apr 69. No copies furnished.

Descriptors: (*Aluminum, Nuclear energy levels), (*Nuclear energy levels, Excitation), Tritons, Alpha particle reactions, Nuclear spins, Ground state, Silicon.

The Si30 (t, alpha)Al29 reaction at a bombarding energy of 11.8 MeV has been used to investigate the states of Al29 up to 4.5-MeV excitation energy. (Author)
AD-698 057

FINAL REPORT.
Rept. for 1 Apr 64-31 Aug 69,
Indiana Univ Bloomington Dept of Physics
Lawrence M. Langer. Dec 69, 11p
Contract Nonr-1705 (02)
See also AD-601 884.

Descriptors: (*Radioactive isotopes, Nuclear structure), (*Nuclear structure, *Nuclear spectroscopy), Beta decay, Nuclear spins, Parity, Half life, Gamma-ray spectra, Decay schemes.

The objectives of the contract were in the area of Nuclear Spectroscopy. The overall aim has been to obtain information which could extend a knowledge of nuclear structure by studying the properties of radiation emitted by radioactive isotopes. More specifically, the investigations have

involved: The determination of decay modes and spin and parity assignments of nuclear levels; Precision studies of the detailed shapes of beta-spectra in allowed and forbidden transitions; and Beta-gamma angular correlation measurements.
AD-698 178 HC$3.00 MF$0.65

THE 14N (n,xgamma) REACTION FOR 8.5< or= En< or= 11 MeV.
Technical note,
Oak Ridge National Lab Tenn
J. K. Dickens, and F. G. Perey. 26 Nov 69, 9p Rept no. ORNL-TM-2778

Descriptors: (*Nitrogen, Gamma-neutron reactions), (*Gamma-neutron reactions, Differential cross section), Gamma-ray spectra, Excitation.

Differential cross sections are given for the production of discrete-energy gamma rays by neutron interaction with nitrogen for E sub n between 8.5 and 11 MeV. (Author)
AD-698 207 HC$3.00 MF$0.65

REACTOR PHYSICS DIVISION ANNUAL REPORT, JULY 1, 1967 - JUNE 30, 1968.
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18K.
For abstract, see NSA 23 23.
ANL-7410 HC$3.00 MF$0.65

FAST-NEUTRON CROSS SECTIONS OF HAFNIUM, GADOLINIUM, AND SAMARIUM,
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
ANL-7567 HC$3.00 MF$0.65

EFFECT OF FLUCTUATIONS OF THE PARTIAL WIDTHS ON THE COMPETITION BETWEEN FISSION AND INELASTIC SCATTERING,
Brookhaven National Lab., Upton, N.Y.
N. S. Rabotnov. Jun 69, 10p
Trans. of Yadernaya Fizika (USSR) v9 n4 p775-778 Apr 69, by Stephen J. Amoretty.

Descriptors: (*Fission, *Neutron cross sections), (*Inelastic scattering, Neutron cross sections), USSR.
Identifiers: *Fission cross sections, Translations.

For abstract, see NSA 23 23.
BNL-tr-275 HC$3.00 MF$0.65

KNOCK-OUT OF FAST He3 FRAGMENTS FROM LIGHT NUCLEI BY 665-MeV PROTONS,
Brookhaven National Lab., Upton, N.Y.
V. I. Komarov, G. E. Kosarev, and O. V. Savchenko. 1969, 20p
Trans. of Joint Inst. for Nuclear Research, Dubna (USSR) JINR-P1-4373 20p 1969, by Stephen J. Amoretty.

Descriptors: (*Proton scattering, *Alpha particles), Nuclear structure, Deuterons, Elastic scattering, Differential cross section, USSR.
Identifiers: Translations.

For abstract, see NSA 23 23.
BNL-tr-281 HC$3.00 MF$0.65

QUASIELASTIC SCATTERING OF 665-MeV PROTONS BY ALPHA-PARTICLE CLUSTERS IN LIGHT NUCLEI,
Brookhaven National Lab., Upton, N.Y.
V. I. Komarov, G. E. Kosarev, and O. V. Savchenko. 1969, 17p
Trans. of Joint Inst. for Nuclear Research, Dubna (USSR) JINR-P1-4227 20p 1969, by S. J. Amoretty.

Descriptors: (*Proton scattering, *Alpha particles), Nuclear structure, Nuclear cross sections, USSR.
Identifiers: Translations.

For abstract, see NSA 23 23.
BNL-tr-282 HC$3.00 MF$0.65

GAMMA-RAY SPECTRUM FROM RADIATIVE CAPTURE IN Cs,
Brookhaven National Lab., Upton, N.Y.
F. Becvar, J. Vrzal, J. Liptak, and J. Urbanec. Jul 69, 14p
Trans. of Chekhoslovatskii Fizicheskii Zhurnal, v19 p248-253 1969, by Stephen J. Amoretty.

Descriptors: (*Neutron capture gamma rays, *Cesium), Gamma-ray spectra, Resonance scattering, Czechoslovakia.
Identifiers: Translations.

For abstract, see NSA 23 23.
BNL-tr-284 HC$3.00 MF$0.65

PROBABILITIES OF E-LAMBDA TRANSITIONS AND ALLOWED BETA DECAY IN ODD-MASS DEFORMED NUCLEI,
Brookhaven National Lab., Upton, N.Y.
F. A. Gareev, S. P. Ivanova, and M. I. Chernei. Jul 69, 11p
Trans. of Joint Inst. for Nuclear Research, Dubna (USSR) JINR-P4-3935 11p 1968, by Stephen J. Amoretty.

Descriptors: (*Rare earth elements, Nuclear energy levels), Excitation, Beta decay, Wave functions, USSR.
Identifiers: *Transition probabilities, Translations.

For abstract, see NSA 23 23.
BNL-tr-285 HC$3.00 MF$0.65

CORRELATION FUNCTIONS FOR NUCLEAR MATTER,
Brookhaven National Lab., Upton, N.Y.
G. F. Filippov, and A. I. Steshenko. Aug 69, 12p
Trans. of Akademiya Nauk URSR, Kiev. Instytut Teoreticheskoi Fiziki, Report ITF-69-18 12p 1969, by Stephen J. Amoretty.

Descriptors: (*Nuclear Binding energy, Wave functions), Statistical functions, Nuclear models, USSR.
Identifiers: Translations.

For abstract, see NSA 23 23.
BNL-tr-289 HC$3.00 MF$0.65

ENVIRONMENTAL EFFECTS ON INTERNAL CONVERSION RATES,
Brookhaven National Lab., Upton, N.Y.
M. L. Perlman, and G. T. Emery. 1968, 11p CONF-690818-3
Prepared in cooperation with Indiana Univ., Bloomington. Presented at International Conference on Radioactivity in Nuclear Spectroscopy, Nashville, Tenn. Aug 68.

Descriptors: (*Nuclear isomers, *Internal conversion), Half life, Electron transitions.

For abstract, see NSA 23 23.
BNL-13921 HC$3.00 MF$0.65

NUCLEAR AND PHYSICAL PROPERTIES OF 252Cf,
Brookhaven National Lab., Upton, N.Y.
A. Prince. Apr 69, 91p* BNL-T-530

Descriptors: (*Californium, *Nuclear properties), Alpha decay, Decay schemes, Neutron reactions, Fission products, Neutron cross sections.

For abstract, see NSA 23 23.
BNL-50168 HC$3.00 MF$0.65

DUALITY,
California Inst. of Tech., Pasadena.
S. Frautschi. Jul 69, 22p
Contract AT (11-1)-68

Descriptors: (*Regge poles, Approximation (Mathematics)), Potential scattering, Corrections.
Identifiers: *Scattering amplitude, *Duality (Elementary particles).

For abstract, see NSA 23 23.
CALT-68-218 HC$3.00 MF$0.65

SELECTION RULES FOR DIFFRACTION DISSOCIATION,
California Inst. of Tech., Pasadena.
S. Frautschi. Jul 69, 19p
Contract AT (11-1)-68

Descriptors: (*Nuclear reactions, Diffraction), Selection rules, Regge poles.
Identifiers: Diffraction scattering, *Diffraction dissociation reactions, Quarks.

For abstract, see NSA 23 23.
CALT-68-220 HC$3.00 MF$0.65

CONJECTURED SET OF EXACT BOOTSTRAP EQUATIONS,
California Univ., Riverside.
Chu Shu-Yuan, P. Kaus, and F. Zachariasen. Sep 69, 24p CTSL-IR-45
Contract AT (11-1)-68
Prepared in cooperation with California Inst. of Tech., Pasadena.

Descriptors: (*Regge poles, Equations), Elementary particles.
Identifiers: *Bootstrap hypothesis.

For abstract, see NSA 23 23.
CALT-68-221 HC$3.00 MF$0.65

PHENOMENOLOGY BASED ON POINCARE GROUP ANALYSIS.
Doctoral thesis,
Ames Lab., Iowa.
Edward Owen Thorland. Aug 69, 133p
Contract W-7405-eng-82

Descriptors: (*Elementary particles, *Groups (Mathematics)), Nuclear reactions, Theses.
Identifiers: *Poincare group.

For abstract, see NSA 23 23.
IS-T-324 HC$3.00 MF$0.65

MULTIPLE SCATTERING CORRECTIONS FOR THE ASSOCIATED-PARTICLE NEUTRON TIME-OF-FLIGHT TECHNIQUE.
Technical note,
National Bureau of Standards, Washington, D.C. Center for Radiation Research.
Allan C. B. Richardson. Oct 69, 72p
Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.65.

Descriptors: (*Neutron cross sections, Computer programs), Differential cross section, Deuteron bombardment, Tritium, Monte Carlo method.
Identifiers: Neutron time of flight, MAGGIE computer code.

The computer code, MAGGIE, for the calculation of multiple scattering and sample attenuation in neutron differential cross-section measurements, has been revised and corrected. The particular case of the scattering geometry required by the associated-particle time-of-flight is considered in detail. (Author)
NBS-TN-499 HC$0.65 MF$0.65

STUDY OF Negative Sigma Hyperon+p yields LAMBDA+n AND Negative sigma hyperon+p yields neutral sigma hyperon+n REACTIONS AT

P/sub negative sigma hyperon/BETWEEN O AND 600 MeV/c,
Massachusetts Univ., Amherst.
S. Steven Yamamoto, David Stephen, Gerald W. Meisner, Richard R. Kofler, and Stanley S. Hertzbach. 4 Sep 69, 13p CONF-690503-5
Contract AT (30-1)-3651
Prepared in cooperation with Brookhaven National Lab., Upton, N.Y. Presented at International Conference on Hypernuclear Physics, Argonne, Ill. May 69.

Descriptors: (*Sigma hyperons, *Proton reactions), Bubble chambers, Mathematical analysis.

For abstract, see NSA 23 23.
NYO-3651-11 HC$3.00 MF$0.65

PEGRAM NUCLEAR PHYSICS LABORATORIES PROGRESS REPORT JANUARY-DECEMBER 1968.
Columbia Univ., New York. Dept. of Physics.
1968, 138P
Contract AT (30-1)-GEN-72

Descriptors: (*Nuclear physics, Reports), Neutron reactions, Nuclear spectroscopy, Nuclear structure, Nuclear physics laboratories, Instrumentation.

For abstract, see NSA 23 23.
NYO-72-227 HC$3.00 MF$0.65

MESON-BARYON SCATTERING LENGTHS FROM CHIRAL SU/3/ TIMES SU/3/ EFFECTIVE LAGRANGIANS.
International Centre for Theoretical Physics, Trieste (Italy).
A. M. Rashid. Aug 69, 18p IC/69/84
Subm- Submitted for Publication

Descriptors: *Baryons, *Invariance, *Lagrange multipliers, *Mesons, *Scattering, Particle interactions, S matrix theory, S waves, Transformations (mathematics).

For abstract, see STAR 07 24.
N69-40037 HC$3.00 MF$0.65

VENEZIANO AMPLITUDE AND LORENTZ POLES.
Rome Univ. (Italy). Inst. of Physics.
M. L. Paciello, L. Sertorio, and B. Taglienti. 27 Dec 68, 15p AD-691277
Contract F61052-67-C-0084
Seri- Its Nota Interna No. 200

Descriptors: *Amplitudes, *Lorentz transformations, *Regge poles, *Scattering, Elementary particles, Functions (mathematics), Resonance.

For abstract, see STAR 07 24.
N69-40084 HC$3.00 MF$0.65

QUASIPOTENTIAL THEORY OF HIGH-ENERGY HADRON SCATTERING.
International Centre for Theoretical Physics, Trieste (Italy).
V. R. Garsevanishvili, V. A. Matveev, L. A. Slepchenko, and A. N. Tavkhelidze. Aug 69, 37p IC/69/87

Descriptors: *Hadrons, *High energy interactions, *Potential energy, *Regge poles, *Scattering amplitude, Born approximation, Perturbation theory, Quantum theory.

For abstract, see STAR 07 24.
N69-40114 HC$3.00 MF$0.65

S U/3/ TIMES SU/3/ BREAKING AND THE MESON SYSTEM.
Rome Univ. (Italy). Inst. of Physics.
A. K. Mohanti. 10 Jun 69, 18p
Seri- Its Nota Interna 223

Descriptors: *Field theory (algebra), *Hadrons, *Transformations (mathematics), Form factors, Mesons, Particle spin, Vector currents.

For abstract, see STAR 07 24.
N69-40234 HC$3.00 MF$0.65

RECOIL SPECTRA PRODUCED BY 141 ME V NEUTRONS.
Spectres de Renvoi des Gammas Produits Par des Neutrons de 14, 1 Mev
Commissariat A L Energie Atomique, Limeil (France). Centre D'etudes Nucleaires.
G. Clayeux, and G. Grenier. Aug 69, 35p CEA-R-3807
Lang- in French, English Summary

Descriptors: *Gamma rays, *Radiation detectors, *Radiation spectra, *Recoil ions, *Recoilings, Aluminum, Carbon, Iron, Lead (metal), Neutron irradiation, Nitrogen, Nuclear capture, Oxygen, Particle interactions, Scattering cross sections, Time of flight spectrometers, Transition probabilities.

For abstract, see STAR 07 24.
N69-40270 HC$3.00 MF$0.65

NEUTRON ELASTIC SCATTERING CROSS SECTIONS EXPERIMENTAL DATA AND OPTICAL MODEL CROSS SECTION CALCULATIONS - A COMPILATION OF NEUTRON DATA FROM THE STUDSVIK NEUTRON PHYSICS LABORATORY.
Aktiebolaget Atomenergi, Studsvik (Sweden).
B. Holmqvist, and T. Wiedling. Jun 69, 213p AE-366

Descriptors: *Elastic scattering, *Neutron scattering, *Scattering cross sections, Energy distribution, Potential energy, Tables (data).

For abstract, see STAR 07 24.
N69-40288 HC$3.00 MF$0.65

INTERACTION CROSS SECTIONS OF NUCLEONS WITH HELIUM.
Secheniya Vzaimodeystviya Nyklonov S Geliyem
Aztec School of Languages, Inc., Maynard, Mass. Research Translation Div.
V. S. Barashenkov. Oct 69, 4p NASA-TT-F-12606, JINR-P2-4333
Contract NASW-1692
Coll- 4 P Refs Tran- Transl. Into English From Russian Report Jinr-p2-4333

Descriptors: *Cross sections, *Helium, *Nucleon-nucleon interactions, Inelastic scattering, Nuclei (nuclear physics), Problem solving.

For abstract, see STAR 07 24.
N69-40334 HC$3.00 MF$0.65

RADIATIVE CORRECTIONS TO WEAK DECAYS INVOLVING LEPTONS.
International Centre for Theoretical Physics, Trieste (Italy).
Riazuddin. Jul 69, 51p IC/69/85
Conf- Presented At the Intern. Summer School on Weak Interactions, Karlsruhe, West Ger., Jul. 1969

Descriptors: *Leptons, *Particle interactions, *Radioactive decay, Feynman diagrams, Radiative recombination, Transformations (mathematics), Vector currents.

For abstract, see STAR 07 24.
N69-40515 HC$3.00 MF$0.65

GAMMA RADIATION FROM FISSION FRAGMENTS. EXPERIMENTAL APPARATUS - MASS SPECTRUM RESOLUTION.
Aktiebolaget Atomenergi, Studsvik (Sweden). Neutron Physics Lab.
For primary bibliographic entry see Field 18D.
For abstract, see STAR 07 24.
N69-40559 HC$3.00 MF$0.65

MULTIPLE SCATTERING CORRECTIONS TO PION-PHOTOPRODUCTION.
Rome Univ. (Italy). Inst. of Physics.
G. Benfatto, F. Nicolo, and G. C. Rossi. 18 Jun 69, 35p
Seri- Its Nota Interna 227

Descriptors: *Photoproduction, *Pions, *Scattering amplitude, Absorption cross sections, Elastic scattering, High energy interactions, Mathematical models, Regge poles.

For abstract, see STAR 07 24.
N69-40578 HC$3.00 MF$0.65

STUDY OF EXCITED STATES OF THE CO 59 NUCLEUS BY MEASUREMENTS OF GAMMA-GAMMA ANGULAR CORRELATION AND LIFETIME.
Untersuchung Angeregter Zustaende des Kerns Co 59 Durch Gamma-gamma-winkelkorrelations Und Lebensdauermessungen
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Allgemeine Wissenschaften.
I. Arens. 1969, 50p
Lang- in German

Descriptors: *Angular correlation, *Cobalt isotopes, *Excitation, *Gamma rays, *Half life, Atomic energy levels, Beta particles, Hyperfine structure, Multipoles, Radioactive decay, Spin-spin coupling, Wave functions.

For abstract, see STAR 07 24.
N69-40618 HC$3.00 MF$0.65

CLOSED UNIVERSE AND LAWS OF CONSERVATION OF ELECTRIC BARYON, AND LEPTON CHARGES.
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
M. A. Markov. 1969, 31p JINR-D2-4534
Lang- in Russian

Descriptors: *Baryons, *Conservation laws, *Leptons, Electric charge, Matter (physics), Nuclear physics.

For abstract, see STAR 07 24.
N69-40750 HC$3.00 MF$0.65

COLLECTED PAPERS ON DISINTEGRATION STUDIES OF SHORT-LIVED NUCLIDES.
Japan Atomic Energy Research Inst., Tokyo.
T. Ishimori, and K. Ueno. Jul 69, 34p JAERI-1178

Descriptors: *Disintegration, *Half life, *Nuclides, *Purification, *Radioactive decay, *Radiochemistry, Barium, Calcium isotopes, Irradiation, Niobium isotopes, Protactinium isotopes, Rhodium isotopes, Scandium isotopes, Titanium, Yttrium.

For abstract, see STAR 07 24.
N69-41092 HC$3.00 MF$0.65

COMPLETE SOLUTION OF A RELATIVISTIC BETHE- SALPETER EQUATION FOR BOUND CONDITIONS.
Vollstaendige Loesung Einer Relativistischen Bethe-salpeter-gleichung Fuer Gebundene Zustaende
Technische Hochschule Munchen (West Germany).
E. Zur Linden. 1969, 60p
Lang- in German

Descriptors: *Bethe-salpeter equation, *Problem solving, *Relativistic particles, *Wave functions, Quantum numbers, Theoretical physics.

For abstract, see STAR 07 24.
N69-41104 HC$3.00 MF$0.65

POTENTIAL SCATTERING IN THE LIMIT OF LARGE COUPLING.
Centre National de La Recherche Scientifique, Marseilles (France). Centre de Physique Theorique.
K. Chadan, and E. Mourre. 1969, 31p REPT-69/P.291

Descriptors: *Constants, *Couplings, *Particle collisions, *Potential theory, *Scattering functions, Green function, Hankel functions, Theoretical physics, Wave interaction.

For abstract, see STAR 07 24.
N69-41201 HC$3.00 MF$0.65

BROKEN SYMMETRY SUM RULES AND RHO-OMEGA MIXING.
Montpellier Univ. (France).
F. M. Renard. Sep 69, 11p PM/69/7

Descriptors: *Electromagnetic interactions, *Mixing, *Performance prediction, *Sum rules, Matrix methods, Quantum mechanics, Symmetry, Theoretical physics, U spin space.

For abstract, see STAR 07 24.
N69-41332 HC$3.00 MF$0.65

BASIC PRINCIPLES OF A HIGH-DUTY-CYCLE ELECTRON-RING ACCELERATOR.
Grundkonzeption Eines Dauerstrich-Elektronenringbeschleunigers
Addis Translations International, Woodside, Calif.
California Univ., Berkeley. Lawrence Radiation Lab.
H. Hultschig. May 69, 10p UCRL-TRANS-1396
Tran- Transl. Into English From German Report Lang- in English and German Spon- Sponsored By Aec Prep- Prepared for Lawrence Radiation

Descriptors: *Electron energy, *Frequencies, *Impulses, *Storage rings (particle accelerators), Electron beams, Ionization, Kinetic energy.

For abstract, see STAR 07 24.
N69-41385 HC$3.00 MF$0.65

HELENE - A COMPUTER PROGRAM TO CALCULATE NUCLEAR CROSS SECTIONS EMPLOYING THE HAUSER-FESHBACH MODEL, PORTER-THOMAS WIDTH FLUCTUATIONS, AND CONTINUUM STATES,
Oak Ridge National Lab., Tenn.
S. K. Penny. 18 Aug 69, 35p
Contract W-7405-eng-26

Descriptors: (*Differential cross section, Programming (Computers), Nuclear models, Neutron cross sections, Neutron reactions.
Identifiers: HELENE computer program.

For abstract, see NSA 23 23.
ORNL-TM-2590 HC$3.00 MF$0.65

SUPERTOG: A PROGRAM TO GENERATE FINE GROUP CONSTANTS AND P sub n SCATTERING MATRICES FROM ENDF/B,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18K.
For abstract, see NSA 23 23.
ORNL-TM-2679 HC$3.00 MF$0.65

FORM FACTORS FOR INELASTIC SCATTERING: THE CODE ATHENA IV,
Oak Ridge National Lab., Tenn.
F. S. Chwieroth, J. I. Dodson, M. B. Johnson, L. W. Owen, and G. R. Satchler. 5 Sep 69, 21p

Descriptors: (*Inelastic scattering, Programming (Computers)), Wave functions, Nuclear forces.
Identifiers: ATHENA 4 computer code.

For abstract, see NSA 23 23.
ORNL-TM-2703 HC$3.00 MF$0.65

INELASTIC INTERACTIONS OF HIGH-ENERGY PROTONS WITH ATOMIC NUCLEI,
Oak Ridge National Lab., Tenn.
V. S. Barashenkov, K. K. Gudima, and V. D. Toneev. 1969, 15p
Trans. of Joint Inst. for Nuclear Research, Dubna (USSR) JINR-P2-4402 15p.

Descriptors: (*Inelastic scattering, Protons), Nuclei, Particle spectra, Photographic emulsions, USSR.
Identifiers: *Intranuclear cascade reactions, Translations, *Nuclear evaporation reactions.

For abstract, see NSA 23 23.
ORNL-tr-2200 HC$3.00 MF$0.65

SEMIEMPIRICAL FORMULAS FOR DOUBLE DIFFERENTIAL CROSS SECTIONS OF SECONDARY NUCLEON PRODUCTION IN BOMBARDMENT OF NUCLEI BY NUCLEONS WITH AN ENERGY OF SEVERAL HUNDRED MeV,
Oak Ridge National Lab., Tenn.
B. S. Sychev. 1969, 16p
Trans. of Joint Inst. for Nuclear Research, Dubna (USSR) JINR-P2-4306 16p.

Descriptors: (*Shielding, Differential cross sections), (*Inelastic scattering, *Nucleons), Particle spectra, Distribution functions, USSR.
Identifiers: *Intranuclear cascade reactions, Translations.

For abstract, see NSA 23 23.
ORNL-tr-2203 HC$3.00 MF$0.65

ANALYTIC REPRESENTATION OF PHOTONUCLEON AND PHOTOPION DIFFERENTIAL YIELDS RESULTING FROM HIGH-ENERGY ELECTRONS (50 less than or equal to Eo less than or equal to 400 MeV) INCIDENT ON AN INFINITE COPPER TARGET,
Oak Ridge National Lab., Tenn.
T. A. Gabriel. Sep 69, 31p
Contract W-7405-eng-26

Descriptors: (*Electron bombardment, Copper), (*Copper, *Photonuclear reactions), Particle spectra, Nucleons, Pions, Differential cross section, Monte Carlo method.
Identifiers: *Photoneutrons, *Photoprotons, *Photomesons.

For abstract, see NSA 23 23.
ORNL-4442 HC$3.00 MF$0.65

PHOTONUCLEON AND PHOTOPION PRODUCTION FROM HIGH-ENERGY (50 TO 400 MeV) ELECTRONS IN THICK COPPER TARGETS,
Oak Ridge National Lab., Tenn.
T. A. Gabriel, and R. G. Alsmiller, Jr. Sep 69, 51p
Contract W-7405-eng-26

Descriptors: (*Electron bombardment, Copper), (*Copper, *Photonuclear reactions), Particle spectra, Nucleons, Pions, Differential cross section.
Identifiers: *Photoneutrons, *Photoprotons, *Photomesons.

For abstract, see NSA 23 23.
ORNL-4443 HC$3.00 MF$0.65

THE 14N (n, x gamma) REACTION FOR 8.5= or< E sub n= or< 11 MeV,
Oak Ridge National Lab., Tenn.
J. K. Dickens, and F. G. Perey. 26 Nov 69, 9p
ORNL-TM-2778

Descriptors: (*Nitrogen, Gamma-neutron reactions), (*Gamma-neutron reactions, Differential cross section), Inelastic scattering.

Differential cross sections are given for the production of discrete-energy gamma rays by neutron interaction with nitrogen for E sub n between 8.5 and 11 MeV. (Author)

PB-188 147 HC$3.00 MF$0.65

REMARKS ON THE REACTION p+d yields a neutral Boson+3He: NEW PROBES OF NUCLEAR CORRELATIONS AT SMALL DISTANCES AND SU (3) SYSTEMATICS,
Princeton-Pennsylvania Accelerator, Princeton, N.J.
Saul Barshay. 25 Aug 69, 8p
Contract AT (30-1)-2137

Descriptors: (*Proton reactions, Deuterons), Inelastic scattering, Bosons, Groups (Mathematics).
Identifiers: SU3 theories.

For abstract, see NSA 23 23.
PPAR-23 HC$3.00 MF$0.65

NUCLEAR PHYSICS GROUP ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1969.
Oregon State Univ., Corvallis. Dept. of Physics.

1969, 82P
Contract AT (45-1)-1062

Descriptors: (*Nuclear physics, Reports), Beta-ray spectroscopy, Gamma-ray spectroscopy, Groups (Mathematics), Nuclear reactions, Cyclotrons.

For abstract, see NSA 23 23.
RLO-1062-691 HC$3.00 MF$0.65

COMPETITION BETWEEN NEUTRON EMISSION AND FISSION AT MODERATE EXCITATION ENERGIES IN THE URANIUM REGION.
Thesis,
Washington Univ., Seattle.
Charles Joseph Bishop. 1969, 104p

Descriptors: (*Uranium, *Neutron reactions), Californium, Fission, Neutron spectrum, Fission products, Theses.

For abstract, see NSA 23 23.
RLO-1388-99 HC$3.00 MF$0.65

MUON PAIR PRODUCTION IN STRONG INTERACTIONS AND THE ASYMPTOTIC SUM RULES (Rozhdenie Myuonnykh par v Silnykh Vzaimodeistviyakh: Asimptoticheskie Pravila Summ),
Stanford Linear Accelerator Center, Calif.
V. A. Matveev, R. M. Muradyan, and A. N. Tavkhelidze. 1969, 27p
Trans. of Joint Inst. for Nuclear Research, Dubna (USSR) JINR-P2-4543 23p 1969, by T. Watt.

Descriptors: (*Muons, *Pair production), Leptons, Inelastic scattering, Field theory, Algebra, USSR.
Identifiers: *Sum rules, Translations.

For abstract, see NSA 23 23.
SLAC-Trans-98 HC$3.00 MF$0.65

CURRENT ALGEBRA AND THE DECAY RATE OF eta yields 3pi,
Syracuse Univ., N.Y. Dept. of Physics.
Suk Koo Yun, and Kunio Yamamoto. Aug 69, 12p
NYO-3399-203

Descriptors: (*Meson reactions, Mathematical analysis), Algebras, Decay schemes.
Identifiers: *Eta mesons, *Current algebras.

For abstract, see NSA 23 23.
SU-1206-203 HC$3.00 MF$0.65

IN SEARCH OF THE ROPER RESONANCE IN negative pion+p yields gamma+n,
California Univ., Los Angeles.
B. M. K. Nefkens, P. Berardo, R. P. Haddock, L. J. Verney, and M. E. Zeller. 4 Sep 69, 8p CONF-690911-1
Contract AT (11-1)-34

Prepared in cooperation with California Univ., Berkeley. Presented at the International Symposium on Electron and Photon Interactions at High Energies, Daresbury (England).

Descriptors: (*Pions, Proton scattering), Differential cross section, Gamma-neutron reactions, Resonance scattering.
Identifiers: *Photoproduction.

For abstract, see NSA 23 23.
UCLA-34-P-106-42 HC$3.00 MF$0.65

CALCULATIONS OF THE FLATTENING OF IDEALIZED NUCLEI DURING HEAD-ON COLLISIONS,
California Univ., Berkeley. Lawrence Radiation Lab.
Jaromir Maly, and James Rayford Nix. 23 Jun 67, 1p CONF-670910
Presented at the International Conference on Nuclear Structure, Tokoyo, (Japan).

Descriptors: (*Nuclear structure, Deformation), Nuclear scattering, Nuclear forces, Nuclear models, Electrostatic fields.

For abstract, see NSA 23 23.
UCRL-17541 HC$3.00 MF$0.65

ASYMMETRY PARAMETERS IN NEGATIVE SIGMA HYPERON YIELDS NEUTRON ELECTRON ANTINEUTRINO AND POSITIVE SIGMA HYPERON YIELDS PROTON GAMMA.
Doctoral thesis,
California Univ., Berkeley. Lawrence Radiation Lab.
Lawrence Kenneth Gershwin. 2 Jun 69, 117p
Contract W-7405-eng-48

Descriptors: (*Sigma hyperons, Decay schemes), Bubble chambers, Polarization, Theses.

For abstract, see NSA 23 23.
UCRL-19246 HC$3.00 MF$0.65

THRESHOLD PHOTONEUTRON CROSS SECTIONS AND ANALOG STATES,
California Univ., Livermore. Lawrence Radiation Lab.
B. L. Berman, R. J. Baglan, and C. D. Bowman. 27 Jun 69, 8p CONF-690816-3
Presented at the Gordon Conference for Photonuclear Reactions, Tilton, N.H. Aug 69.

Descriptors: (*Gamma-neutron reactions, Nuclear cross sections), Nuclear energy levels, Neutron spectrum, Nuclear spectroscopy.
Identifiers: *Photoneutrons, Isobaric analog states.

For abstract, see NSA 23 23.
UCRL-71831 HC$3.00 MF$0.65

REPORTS TO THE AEC NUCLEAR CROSS SECTIONS ADVISORY COMMITTEE. MEETING HELD AT OAK RIDGE NATIONAL LABORATORY, OAK RIDGE TENNESSEE, APRIL 15-17, 1969,
Nuclear Cross Sections Advisory Committee (AEC).
M. S. Moore. 1969, 276p EANDC (US)-120-U, INDC (US)-10-U

Descriptors: (*Nuclear cross sections, Reports), Neutron cross sections, Alpha cross sections, Proton cross sections, Gamma rays, Nuclear models, Nuclear structure.

For abstract, see NSA 23 23.
WASH-1127 HC$3.00 MF$0.65

20I. Plasma Physics

TRANSIENTS IN ELECTRON PLASMAS.
Internal memo.,
Stanford Univ Calif Inst for Plasma Research
Heinrich Derfler, and T. C. Simonen. Aug 65, 16p Rept no. SU-IPR-28
Contract AF 33 (615)-1504
Presented at Stanford Univ. Electronics Research Review, Stanford, Calif., 16-20 Aug 65.

Descriptors: (*Plasma oscillations, Electrostatic fields), Green's function, Wave functions, Electrons, Transients.

It is shown that evanescent Bohm and Gross waves and Van Kampen modes are both aspects of one and the same analytic wave function and thus really do not exist independently. This new wave function is subject to the Fried and Conte dispersion relation, casual in nature, and rigorously describes electrostatic events in plasmas. In fact it was found possible to solve the age old problem of constructing the Green's function from these waves. By means of this Green's function the signal propagating through the plasma due to any other mode of excitation can be obtained by simple convolution. (Author)
AD-697 947 HC$3.00 MF$0.65

GROWING WAVE AND INSTABILITY CRITERIA FOR HOT PLASMAS,
Stanford Univ Calif Inst for Plasma Research
Heinrich Derfler. 1967, 5p Rept no. SU-IPR-153
Contract F33615-67-C-1284

Descriptors: (*Plasma medium, Stability), Wave transmission, Dispersion relations, Integral transforms.

In the original colliding-pole criterion for determining instability types from dispersion relations, the Landau poles had to be selected laboriously. The simple rule is proved that only poles colliding through negative wave number lead to nonconvective instability. (Author)
AD-697 949 HC$3.00 MF$0.65

ACCURACY OF DIFFERENTIAL APPROXIMATION FOR RADIATIVE IONIZATION IN COLD PRECURSOR OF AXISYMMETRIC DETACHED SHOCK,
Brown Univ Providence R I Div of Engineering
Anthony N. Pirri, and Joseph H. Clark. Sep 69, 30p
Contract Nonr-562 (35)

Descriptors: (*Gas ionization, *Shock waves), (*Blunt bodies, Hypersonic characteristics), Argon, Photons, Differential equations, Axially symmetric flow, Approximation (Mathematics), Heat transfer, Electron density, Accuracy.
Identifiers: Helmholtz equation.

Radiative ionization in the cold precursor of the shock preceding a blunt body immersed in a hypersonic monatomic gas flow is studied using the Milne-Eddington type differential approximation. In order to assess the accuracy of the differential approximation for a multidimensional, axisymmetric geometry, the results are compared with earlier work that presents an exact formulation. The precursor gas is non-emitting with a prescribed frequency dependent absorption coefficient, and the governing differential equation describing the radiation in the precursor is the (elliptic) Helmholtz equation; specification of the boundary conditions pose an interesting dilemma. An integral formulation is proposed and the resulting integral equation is solved to yield the spectral radiant energy density. Calculations of the volumetric photon absorption and the degree of ionization for argon in the near precursor are presented for a downstream degree of ionization on the stagnation streamline of 0.8, an upstream temperature of 300K, and an upstream pressure of .001 atm. The results are found to be sufficiently accurate for many purposes when the influenced point is only a few photon mean free paths from the surface and is close to the shock axis. (Author)
AD-697 974 HC$3.00 MF$0.65

PLASMA WIND TUNNEL EXPERIMENT.
Topical research rept. Apr-Sep 69,
Cornell Univ Ithaca N Y Lab of Plasma Studies
W. W. Destler, and D. L. Morse. Oct 69, 31p Rept no. LPS-31
Contract N00014-67-A-0077-0002

Descriptors: (*Plasma medium, *Wind tunnels), Magnetic fields, Boundary layer, Supersonic flow.

A plasma wind tunnel facility, similar to that described by Pugh and Patrick, is used to produce a super-Alfvenic flow of plasma over a magnetic obstacle for times approaching one millisecond. The flowing plasma has a density greater than 2 x 10 to the 13th power/cc on axis, and the density has decreased to one-half the peak value at a radius greater than 25 cm. The magnetic field embedded in the plasma stream is primarily axial and less than 30 gauss in magnitude. The magnetic field of the obstacle is essentially that of a single current-carrying conductor located on a diameter of the plasma stream cross section. The field of the obstacle is distorted by the plasma flow, and a narrow transition region forms in front of the obstacle. Preliminary investigations of the properties of the transition region are discussed. (Author)
AD-697 975 HC$3.00 MF$0.65

LONGITUDINAL OSCILLATIONS IN BOUNDED ONE-DIMENSIONAL NONUNIFORM PLASMAS.
Technical rept.,
Stanford Univ Calif Inst for Plasma Research
K. J. Harker, G. S. Kino, and D. Eitelbach. Sep 67, 32p Rept no. SU-IPR-197
Contract Nonr-255 (48)

Descriptors: (*Plasma oscillations, Kinetic theory), Pressure, Wave transmission, Resonant frequency, Integral equations, Numerical analysis.
Identifiers: Numerical integration.

A study has been made of the oscillations in a one-dimensional nonuniform plasma bounded by specularly reflecting walls. The nonuniformity is assumed to arise from a parabolic shaped static potential distribution. Static magnetic fields and longitudinal propagation are not included. Using Maxwell's equations and the linearized Boltzmann-Vlasov equation, a linear integral equation is derived. This equation is solved numerically to yield the resonances and damping rates of the various modes of the plasma. An alternative solution is obtained by using pressure theory. Comparison of results obtained by both methods shows good agreement, in contrast to earlier results for an infinite plasma, for which the agreement was poor. (Author)
AD-697 979 HC$3.00 MF$0.65

STUDIES OF LOW DENSITY PLASMAS WITH GAS LASERS.
Interim rept. 1 Jul 66-1 Jul 69,
Illinois Univ Urbana Gaseous Electronics Lab
J. T. Verdeyen, and B. E. Cherrington. Sep 69, 95p* ARL-69-0149
Contract AF 33 (615)-5248

Descriptors: (*Plasma medium, Refractive index), (*Gas lasers, Interferometers), Plasma physics, Resolution, Sensitivity, Optics, Cavity resonators, Density, Frequency shift, Gain, Electron density.
Identifiers: *Laser interferometers, *Plasma diagnostics, Plasma density, Heterodyning, Helium neon lasers.

The report describes many of the uses of the gas laser to study the refractive index of a plasma. It is shown that the sensitivity of the laser interferometer can be greatly enhanced by utilizing the transverse modes of an external spherical cavity. The parameters that determine the sensitivity of a spherical laser interferometer are discussed, and detailed theory of such is given. The plasma to be studied can be located in the external cavity or inside the laser cavity. The latter geometry preserves the excellent spatial resolution of the laser and also the high sensitivity of the spherical geometry. In order to achieve even higher sensitivity to very

small changes in plasma refractivity, the laser heterodyne system was evolved. This was applied at the three common He:Ne laser wavelengths of 0.6328 microns, 1.15 microns, and 3.39 microns. The latter transition is especially attractive because of its high gain and inherent sensitivity to the presence of the free electrons in a plasma. However, mode pulling effects at 3.39 microns are quite serious and a technique has been developed to evaluate it. (Author)
AD-697 997 HC$3.00 MF$0.65

ENHANCED LOSSES IN MAGNETO-PLASMA COLUMNS.
Final rept. 26 Mar 66-25 Nov 69,
Texas Univ Austin Dept of Physics
M. E. Oakes, and E. L. Lindman. Nov 69, 7p
AROD-6398:7-P
Grant DA-ARO (D)-31-124-G805

Descriptors: (*Plasma sheath, Diffusion), Plasma physics, Magnetohydrodynamics, Dispersion relations, Radio fields, Stability, Feedback, Reviews.
Identifiers: Plasma control, Radiofrequency plasmas.

The study of enhanced diffusion in a radio-frequency magneto-plasma has been completed. Several candidates for the experimentally observed instability have been suggested. Theoretical work on the problems associated with feedback stabilization through generalized boundary conditions has been focused on two problems: (1) the effect of the sheath, and (2) the question of whether active elements are needed in the stabilizing network. (Author)
AD-698 039 HC$3.00 MF$0.65

STARK-BROADENED HYDROGEN AS TEMPERATURE PROBES IN NITROGEN PLASMAS,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
For primary bibliographic entry see Field 7D.
AD-698 056

MODIFICATION OF THE QUASILINEAR THEORY BY THE SPONTANEOUS EMISSION OF PLASMA WAVES,
California Univ San Diego La Jolla Dept of the Aerospace and Mechanical Engineering Sciences
P. Nunez, and S. Rand. 29 Nov 68, 7p AROD-5133:229-P
Contract DA-31-124-ARO (D)-257
Availability: Pub. in Physics of Fluids, v12 n8 p1666-1672 Aug 69.

Descriptors: (*Plasma oscillations, *Electron beams), Wave transmission, Nonlinear systems, Distribution functions.

The transfer of energy between an electron beam and longitudinal waves in a collisionless plasma has been studied. The quasilinear theory, with the inclusion of the spontaneous emission of wave energy, is used. Numerical solutions of the resulting equations are obtained and compared with those of the quasilinear theory. (Author)
AD-698 100

PLASMA INSTABILITIES AND WAVES EXCITED BY AN ANISOTROPIC ENERGY DISTRIBUTION PRODUCED BY ELECTRON CYCLOTRON RESONANCE.
Quarterly Progress rept. no. 10,
Wisconsin Univ., Madison. Dept. of Electrical Engineering.
J. L. Shohet. 15 Sep 69, 20p
Contract AT (11-1)-1695

Descriptors: (*Plasma medium, Cyclotron resonance phenomena), Stability, Wave transmission, Heating.

For abstract, see NSA 23 23.
COO-1695-24 HC$3.00 MF$0.65

IONOSPHERIC AERODYNAMICS,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 4A.
JPRS-49350 HC$3.00 MF$0.65

PARADOX IN PLASMA DIFFUSION IN TOROIDAL MAGNETIC TRAPS,
Princeton Univ., N.J. Plasma Physics Lab.
A. A. Galeev, and R. Z. Sagdeev. Sep 69, 37p
Contract AT (30-1)-1238
Trans. from Akademiya Nauk SSSR. Institut Yadernoi Fiziki. Trudy, 37p.

Descriptors: (*Plasma medium, Diffusion), Magnetic fields, USSR.

For abstract, see NSA 23 23.
MATT-Trans-90 HC$3.00 MF$0.65

IONOSPHERIC RESEARCH - THE INTERACTION OF AN OBLIQUELY INCIDENT P-POLARIZED PLANE ELECTROMAGNETIC WAVE WITH A HOT PLASMA HALF- SPACE AND PLASMA SLAB.
Pennsylvania State Univ., University Park. Dept. of Electrical Engineering.
For primary bibliographic entry see Field 4A.
For abstract, see STAR 07 24.
N69-40077 HC$3.00 MF$0.65

INSTABILITIES AND GROWING WAVES - POWER ABSORBED OR GENERATED BY THE VARIOUS EXCITED MODES IN A PLASMA.
Instabilities Et Ondes Croissantes. Puissance Absorbee Ou Engendree Par les Differents Modes Excites Dans Un Plasma
Commissariat A L Energie Atomique, Saclay (France). Centre D Etudes Nucleaires.
P. Rolland. Aug 69, 117p CEA-R-3862
Lang- in French, English Summary

Descriptors: *Energy transfer, *Plasma physics, *Wave propagation, Analytic functions, Energy dissipation, Isotropic media, Kinematics, Laplace transformation, Wave dispersion.

For abstract, see STAR 07 24.
N69-40149 HC$3.00 MF$0.65

PLASMA GENERATOR OF THE AEROSPACE RESEARCH CENTER.
l'Impianto Generatore Di Plasma Del Centro Ricerche Aerospaziali
Rome Univ. (Italy). Centro Ricerche Aerospaziali.
C. Buongiorno, and V. Fiorini. Jul 68, 30p REPT-17
Lang- in Italian, English Summary

Descriptors: *Plasma generators, *Research facilities, Arc generators, Crossed fields, Electrodes, Graphs (charts), Plasma jets.

For abstract, see STAR 07 24.
N69-40194 HC$3.00 MF$0.65

ELECTRIC PROBE MEASUREMENTS IN A MOVING MAGNETIZED PLASMA.
Royal Inst. of Tech., Stockholm (Sweden). Plasma Physics Div.
L. Kristoferson, and L. Lindberg. Aug 69, 38p
REPT-69-16

Descriptors: *Collisionless plasmas, *Electric field strength, *Electron spin, *Electrostatic probes, Electric fields, Electric potential, Electrodeless discharges, Electron density (concentration), Hot electrons, Ions, Mean free path, Plasma accelerators, Plasma density, Plasma guns, Plasma probes, Plasma temperature, Translational motion.

For abstract, see STAR 07 24.
N69-40350 HC$3.00 MF$0.65

ON THE INTERACTION BETWEEN A PLASMA AND A NEUTRAL GAS.
Royal Inst. of Tech., Stockholm (Sweden). Plasma Physics Div.
L. Danielsson. Jun 69, 29p REPT-69-17

Descriptors: *Cosmic plasma, *Neutral particles, *Particle collisions, *Plasma interactions, Critical velocity, Energy distribution, Magnetic fields, Plasma accelerators, Plasma guns.

For abstract, see STAR 07 24.
N69-40516 HC$3.00 MF$0.65

PROPAGATION IN A PLANAR INHOMOGENEOUS PLASMA MEDIUM.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
J. D. Norgard. 1 Nov 69, 38p NASA-CR-106397, JPL-TR-32-1394
Contract NAS7-100

Descriptors: *Inhomogeneity, *Plasmas (physics), *Propagation, *Wave reflection, Boundary layers, Refraction, Riccati equation, Vectors (mathematics).

For abstract, see STAR 07 24.
N69-40811 HC$3.00 MF$0.65

DETERMINATION OF THE PARAMETERS OF A PLASMA FORMED BY THE EFFECT OF MICROWAVE POWER IN A MAGNETIC FIELD STEADY-STATE CONDITIONS.
United Kingdom Atomic Energy Authority, Culham (England). Culham Translations Office.
A. I. Anisimov. Apr 69, 13p NP-TR-1789, CTO-614
Tran- Transl. Into English From Russian Report No. Fti-115

Descriptors: *Magnetic fields, *Microwave plasma probes, *Plasma diagnostics, *Plasmas (physics), Analysis (mathematics), Charged particles, Electron energy, Equilibrium, Microwave resonance.

For abstract, see STAR 07 24.
N69-41003 HC$3.00 MF$0.65

SOME PROPERTIES OF RELATIVISTIC PLASMA RINGS.
Einige Eigenschaften Relativistischer Plasmaringe
Addis Translations International, Woodside, Calif.
California Univ., Berkeley. Lawrence Radiation Lab.
W. H. Kegel. May 69, 49p UCRL-TRANS-1397
Tran- Transl. Into English From German Report Ipp-1 Lang- in English and German Spon- Sponsored By Aec Prep- Prepared for Lawrence Radiation Lab.

Descriptors: *Particle accelerators, *Relativistic plasmas, *Ring currents, Ions, Spatial distribution, Vlasov equations.

For abstract, see STAR 07 24.
N69-41089 HC$3.00 MF$0.65

CORRELATION EFFECTS IN SEMI-INFINITE PLASMAS.
Maryland Univ., College Park. Inst. for Fluid Dynamics and Applied Mathematics.
R. L. Guernsey. Jun 69, 48p NASA-CR-106480, BN-613
Contract NGL-21-002-005

Descriptors: *Boundary value problems, *Correlation, *Half spaces, *Ionized gases, *Plasmas (physics), Bbgky hierarchy, Dielectric properties, Equilibrium equations, Kinetic theory, Mathematical models, Nonequilibrium conditions.

For abstract, see STAR 07 24.
N69-41163 HC$3.00 MF$0.65

HELIOS PROGRAM.
Progress rept.,
Miami Univ., Coral Gables, Fla. Dept. of Physics.
Harry S. Robertson. 15 Aug 69, 19p
Contract AT (40-1)-3895

Descriptors: (*Plasma medium, Lithium), Heating.
Identifiers: Helios project.

For abstract, see NSA 23 23.
ORO-3895-7 HC$3.00 MF$0.65

THE MODULE APPROACH TO BLANKET DESIGN: A VACUUM WALL FREE BLANKET USING HEAT PIPES,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 18A.
For abstract, see NSA 23 23.
UCRL-71758 HC$3.00 MF$0.65

PRELIMINARY DESIGN CONSIDERATIONS FOR AN ASTRON POWER REACTOR SYSTEM,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 18A.
For abstract, see NSA 23 23.
UCRL-71768 HC$3.00 MF$0.65

20J. Quantum Theory

TREATMENT OF PAIRING IN MANY-BODY SYSTEMS BY AN EQUATION-OF-MOTION METHOD.
Technical rept.,
Arizona Univ Tucson Dept of Physics
R. H. Parmenter. 21 Nov 69, 35p Rept no. TR-2
Contract N00014-67-A-0209-0007

Descriptors: (*Quantum statistics, N-body problem), Equations of motion, Superconductivity, Superfluidity, Bosons, Fermions, Operators (Mathematics).
Identifiers: Random phase approximation, Elementary excitations, Fermi surfaces, BCS theory, Annihilation creation operators.

A completely unambiguous prescription is presented for extending the equation-of-motion method, including pairing, beyond the random-phase approximation. When combined with the idea of a generalized effective field, this prescription leads to a simple, self-consistent treatment of pairing, lifetime, and renormalization effects in many-body systems. (Author)
AD-698 149 HC$3.00 MF$0.65

CURVATURE COLLINEATIONS FOR GRAVITATIONAL PP-WAVES.
International Centre for Theoretical Physics, Trieste (Italy).

Aug 69, 19p IC/69/80
Spon- Sponsored Partly By Oesterr. Forschungsrat

Descriptors: *Collinearity, *Covariance, *Curvature, *Vector spaces, Conservation laws, Gravitational fields, Lie groups, Plane waves, Riemann manifold.

For abstract, see STAR 07 24.
N69-40287 HC$3.00 MF$0.65

A COVARIANT VERTEX FOR NON-RELATIVISTIC BOUND STATES.
International Centre for Theoretical Physics, Trieste (Italy).
G. Bisiacchi, P. Budini, and G. Calucci. Jul 69, 15p IC/69/72
Subm- Submitted for Publication

Descriptors: *Equations of motion, *High energy interactions, *Internal energy, *Nonrelativistic mechanics, Conferences, Covariance, Field theory (physics), Momentum transfer, Particle spin, Wave functions.

For abstract, see STAR 07 24.
N69-40514 HC$3.00 MF$0.65

ON THE MICROSCOPIC FOUNDATION OF SCALING LAWS.
Rome Univ. (Italy). Inst. of Physics.
C. Di Castro, and G. Jona-lasinio. 5 May 69, 6p
Prep- Prepared Jointly With Ist. Nazl. Fis. Nucl. Seri- Its Nota Interna 222

Descriptors: *Foundations, *Normalizing (statistics), *Scaling laws, Critical point, Field theory (physics), Green function, Two body problem.

For abstract, see STAR 07 24.
N69-40577 HC$3.00 MF$0.65

20K. Solid Mechanics

THE SHOCK AND VIBRATION DIGEST. VOLUME 1, NUMBER 11.
Shock and Vibration Information Center (Defense) Washington D C
Nov 69, 24p
See also Volume 1, Number 10, AD-695 830.
Availability: Paper copy available from Navy Publications and Printing Service Office, Bldg. 157-2, Washington, D. C. 20390. Annual Subscription Price $10.00.

Descriptors: (*Shock (Mechanics), Periodicals), (*Vibration, Periodicals), Symposia, Reviews, Reports, Abstracts, Education, Design, Mathematical models, Acoustics, Digital computers, Earthquakes, Test methods, Machines, Vibration isolators, Structural properties, Propagation, Damping, Elasticity, Hypersonic flow, Blast, Lubrication.
Identifiers: Random vibration.

Contents: Reviews of meetings; Short courses; Abstracts from the current literature--Analysis and design methods, Excitation, Phenomenology, Experimentation, Components, Systems; Book reviews.
AD-697 888 MF$0.65

FLEXURE THEORY OF STRUCTURAL FIBERGLASS BEAMS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13M.
AD-697 916 HC$3.00 MF$0.65

APPROXIMATE DETERMINATION OF STRESSES IN A RECTANGULAR ORTHOTROPIC PLATE OF FINITE DIMENSIONS DURING SYMMETRICAL COMPRESSION BY AN INTERMITTENT LOAD,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13M.
AD-697 917 HC$3.00 MF$0.65

HARMONIC NON-AXISYMMETRIC WAVES WITH SHORT WAVE LENGTHS propagating in composite rods,
Polytechnic Inst of Brooklyn N Y Dept of Aerospace Engineering and Applied Mechanics
Anthony E. Armenakas, and Henry E. Keck. Aug 69, 34p Rept no. PIBAL-69-34
Contract Nonr-839 (40)

Descriptors: (*Rods, Sandwich construction), (*Mechanical waves, Propagation), Composite materials, Laminates, Harmonic analysis, Wave functions, Phase, Velocity, Frequency, Torsion, Bending, Mechanical properties, Stresses, Numerical analysis.
Identifiers: Composite rods, Sandwich laminates, Phase velocity, Circumferential stress, Love waves.

The asymptotic phase velocities at very large wave numbers of non-axisymmetric waves, traveling in composite rods are established analytically. Frequency spectra and mode shapes of composite rods are presented and compared with those of simple (made of one material) rods. (Author)
AD-697 999 HC$3.00 MF$0.65

ON WAVE PROPAGATION IN ONE DIMENSIONAL RUBBERLIKE MATERIALS,
Iowa Univ Iowa City Dept of Mechanics and Hydraulics
W. F. Ames. Oct 69, 14p Rept no. THEMIS-UI-14
Contract DAAF03-69-C-0014
Report on Vibration and Stability of Military and other Complex Vehicular Systems.

Descriptors: (*Rods, Mechanical waves), (*Mechanical waves, Propagation), Wire, Wave functions, Elasticity, Elongation, Stresses, Strain (Mechanics), Elastomers, Series, Problem solving.
Identifiers: Discontinuity (Mathematics), Longitudinal waves, Strain energy methods, Themis project.

An investigation was made of the propagation of mechanical waves in straight bars or wires, or rubber-like materials, having negligible transverse dimensions and possessing a uniform cross section of finite area. The times to discontinuity evolution from smooth initial data are computed and used to ascertain the region of validity of the generalized Lagrange series solution.
AD-698 016 HC$3.00 MF$0.65

DEVELOPMENT AND EVALUATION OF AN APPARATUS FOR THE DIRECT TENSILE TESTING OF ICE.
Cold Regions Research and Engineering Lab Hanover N H
For primary bibliographic entry see Field 14B.
AD-698 022 HC$3.00 MF$0.65

DYNAMIC BEHAVIOR OF A CYLINDER WITH A CUTOUT,
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
For primary bibliographic entry see Field 13M.
AD-698 047

THE TIMOSHENKO BEAM WITH A MOVING LOAD,
Stanford Univ Calif Dept of Aeronautics and Astronautics
For primary bibliographic entry see Field 13M.
AD-698 059

PROPAGATION OF HARMONIC WAVES IN COMPOSITE CIRCULAR CYLINDRICAL SHELLS. PART II. NUMERICAL ANALYSIS,
Polytechnic Inst of Brooklyn Farmingdale N Y Dept of Aerospace Engineering and Applied Mechanics
Anthony E. Armenakas. Oct 69, 53p Rept no. PIBAL-69-44
Contract Nonr-839 (40)
See also Part 1, AD-635 789.

Descriptors: (*Structural shells, Laminates), (*Mechanical waves, Propagation), (*Wave functions, Numerical analysis), Elastic shells, Cylindrical bodies, Rayleigh waves, Phase, Frequency, Stresses, Strain (Mechanics), Determinants, Asymptotic series, Torsion, Bending.
Identifiers: *Cylindrical shells, Phase velocity, Computer analysis.

The frequency equation for harmonic waves with an arbitrary number of circumferential nodes traveling in composite traction-free circular cylindrical shells established in the first part of this investigation has been programmed for numerical evaluation on an IBM 7094 digital computer. The numerical results obtained are employed in evaluating the effect of the changes of the shell

parameters on the frequency and shape of the first few modes of wave propagation. Moreover, the asymptotic limits of the phase velocities for waves having short axial wavelengths are established analytically and verified by the numerical results. (Author)
AD-698 179 HC$3.00 MF$0.65

NONLINEAR ANALYSIS FOR AXISYMMETRIC ELASTIC STRESSES IN RING-STIFFENED, SEGMENTED SHELLS OF REVOLUTION.
Lockheed Missiles and Space Co Palo Alto Calif Lockheed Research Lab
For primary bibliographic entry see Field 13M.
AD-698 204 HC$3.00 MF$0.65

THE SHOCK AND VIBRATION DIGEST. VOLUME 1, NUMBER 12.
Shock and Vibration Information Center (Defense) Washington D C

Dec 69, 52p
See also Volume 1, Number 11, AD-697 888.
Availability: Paper copy available from Navy Publications and Printing Service Office, Bldg. 157-2, Washington, D. C. 20390. Annual Subscription $10.00.

Descriptors: (*Shock, Naval research), (*Vibration, Documentation), Symposia, Abstracts, Reports, Indexes, Programmed instruction, Scientific personnel.

Contents: Reviews of meetings; Short courses; Abstracts from the current literature (analysis and design methods, excitation, phenomenology, experimentation, components, systems); Book reviews; Calendar; Author index; Subject index.
AD-698 213 MF$0.65

AIRFIELD PAVEMENT EVALUATION, USNALF CROWS LANDING, CALIFORNIA.
Naval Civil Engineering Lab., Port Hueneme, Calif.
For primary bibliographic entry see Field 1E.
AD-851 933 HC$3.00 MF$0.65

THERMAL BUCKLING OF PLATES AND CURVED SHELLS IN SUPERSONIC GAS FLOW,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 1C.
JPRS-49331 HC$3.00 MF$0.65

SOME CONTACT PROBLEMS IN ELASTICITY THEORY.
Southampton Univ. (England). Inst. of Sound and Vibration Research.
F. A. Adubi, and G. M. Gladwell. Jul 69, 30p ISVR-TR-23

Descriptors: *Elastic plates, *Pressure distribution, *Punches, Boundary value problems, Fourier transformation, Numerical analysis, Shear stress, Stress concentration.

For abstract, see STAR 07 24.
N69-40115 HC$3.00 MF$0.65

EFFECTS OF PRESSURE DISTRIBUTION ON THE SHAPE OF TENSION SHELL ENTRY VEHICLES.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
J. W. Sawyer. Apr 69, 62p NASA-TM-X-61917

Descriptors: *Aerodynamic loads, *Blunt bodies, *Pressure distribution, *Reentry vehicles, *Stressed-skin structures, Shell stability, Thin walled shells.

For abstract, see STAR 07 24.
N69-40219 HC$3.00 MF$0.65

A NUMERICAL ANALYSIS OF RESTRAINED SHRINKAGE STRESSES IN ABLATION HEAT SHIELDS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
M. B. Dow. Jun 69, 77p NASA-TM-X-61915

Descriptors: *Ablation, *Approximation, *Boundary value problems, *Heat shielding, *Iterative solution, Ablative materials, Shrinkage, Stress analysis, Stress concentration.

For abstract, see STAR 07 24.
N69-40220 HC$3.00 MF$0.65

THE SENSITIVITY OF BUCKLING OF AXIALLY COMPRESSED FIBER-REINFORCED CYLINDRICAL SHELLS TO SMALL GEOMETRIC IMPERFECTIONS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
M. F. Card. Jun 69, 167p NASA-TM-X-61914

Descriptors: *Axial compression loads, *Buckling, *Cylindrical shells, *Reinforced shells, *Shell stability, Matrices (mathematics), Orthotropic cylinders, Perturbation theory, Reinforcing fibers.

For abstract, see STAR 07 24.
N69-40244 HC$3.00 MF$0.65

THE RADIATION RESISTANCE OF CYLINDRICAL SHELLS.
North Carolina State Univ., Raleigh.
F. D. Hart, and C. J. Runkle. Oct 69, 128p NASA-CR-1437
Contract NGR-34-002-035
Coll- 128 P Refs

Descriptors: *Acoustic properties, *Cylindrical shells, *Radiation tolerance, *Sound waves, Differential equations, Digital computers, Equations of motion, Graphs (charts), Numerical analysis, Tables (data).

For abstract, see STAR 07 24.
N69-40935 HC$3.00 MF$0.65

TEST REPORT ON FATIGUE-TESTING OF NICKEL-200 PANELS.
Airesearch Mfg. Co., Los Angeles, Calif.
F. A. Biastre. 10 Jan 69, 17p NASA-CR-66842, AP-68-4617
Contract NAS1-6666

Descriptors: *Construction materials, *Engine parts, *Fatigue tests, *Nickel alloys, *Regenerative cooling, *Thermal cycling tests, Component reliability, Hastelloy (trademark), Hypersonic flight, Tables (data).

For abstract, see STAR 07 24.
N69-41040 HC$3.00 MF$0.65

ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF END-PLANE ROTATIONS OF TRUNCATED CONES UNDER BENDING LOADS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
R. W. Faison, J. L. Gilbert, and W. H. Richards. Nov 69, 30p NASA-TN-D-5536, L-6019
Contract 124-08-13-05-23

Descriptors: *Bending moments, *Cantilever beams, *Cones, *Stiffness, Deflection, Loads (forces), Modulus of elasticity, Thin walled shells.

For abstract, see STAR 07 24.
N69-41141 HC$3.00 MF$0.65

THE ROLE OF STRESS CONCENTRATIONS IN STRUCTURAL FATIGUE.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
J. H. Crews, Jr.. May 69, 155p NASA-TM-X-61969

Descriptors: *Cracking (fracturing), *Cyclic loads, *Fatigue (materials), *Stress concentration, Crack initiation, Crack propagation, Notch strength.

For abstract, see STAR 07 24.
N69-41185 HC$3.00 MF$0.65

IMPACT AND CAVITATION EROSION AND MATERIAL MECHANICAL PROPERTIES,
Michigan Univ., Ann Arbor. Cavitation and Multiphase Flow Lab.
F. G. Hammitt. Nov 69, 30p 03371-1-T
Grant NSF-GK-13081

Descriptors: (*Cavitation, Damage), (*Water impingement, Erosion), Liquid jets, Drops, Impact shock, Damage, Shock resistance, Cratering, Bubbles, Failure (Mechanics), Statistical data, Correlation techniques.
Identifiers: Damage rate, Bubble collapse, Resilience, Standard deviation, Validity.

The mechanisms of mechanical cavitation and liquid impingement damage are reviewed. In the light of available experimental and photographic evidence it is concluded that the predominant mechanisms in real flow situations of mechanical cavitation damage and liquid impingement damage are very probably the same, i.e. liquid jet impingement in both cases. Numerical data relating to the microjet diameter and velocity in the cavitation case is presented. A comprehensive data set involving only metallic materials, but with tests conducted in several types of cavitation facilities as well as liquid impact facilities, is used to obtain a relatively simple best fit correlation in terms of conventional mechanical properties of materials. It is concluded that no very precise correlation of this type with general applicability even for metallic materials is possible, and that a standard error of estimate factor for a new material is of the order of 2.5. (Author)
PB-188 016 HC$3.00 MF$0.65

STRESS FIELDS: HALF SPACE WITH A PRESSURIZED SPHERICAL CAVITY; INFINITE MEDIUM WITH TWO PRESSURIZED SPHERICAL CAVITIES.
Final rept.,
Denver Research Inst., Colo.
J. A. Weese. Oct 69, 59p DRI-2523 SC-CR-69-3287

Descriptors: (*Stresses, Special functions (Mathematical)), Elasticity, Continuum mechanics, Problem solving, Spheres, Pressure, Strain (Mechanics), Interactions, Analytic geometry, Programming (Computers), Computer programs, Boundary value problems, Graphics, Potential theory.
Identifiers: Elastic half spaces, Stress waves, Pressurized spherical cavities, Computer analysis.

The report concerns the state of stress in two closely related axisymmetric problems: (1) A half space containing a pressurized spherical cavity at an arbitrary position below the plane surface; (2) An infinite space containing two spherical cavities of arbitrary size and separation distance, each subjected to an arbitrary pressure. The results presented in this report include: definitions of the problems, modifications required in an earlier analysis, the modified computer program, operating instructions for the modified program, and a discussion of the numerical results with emphasis on the interference effect of pressurized cavities near plane boundaries and the interaction of two pressurized cavities. Results are presented in graphical form. (Author)
PB-188 119 HC$3.00 MF$0.65

HYPERBOLOIDS OF REVOLUTION SUPPORTED ON COLUMNS. (1) COLUMN-SUPPORTED HYPERBOLOIDS UNDER GRAVITY

LOADING. (2) COLUMN-SUPPORTED HYPERBOLOIDS UNDER WIND LOADING.
Washington Univ., St. Louis, Mo. Dept. of Civil and Enviromental Engineering.
For primary bibliographic entry see Field 13M.
PB-188 160 HC$3.00 MF$0.65

ANALYSIS OF SHALLOW SHPERICAL CANTILEVER SHELLS AND SHALLOW SPHERICAL DOMES WITH POLAR OPENINGS UNDER ANTISYMMETRICALLY DISTRIBUTED LOADS,
Sandia Labs., Livermore, Calif.
Oemer A. Fettahlioglu. Sep 69, 254p
Contract AT (29-1)-789

Descriptors: (*Structural shells, Stresses), Mathematical analysis, Loading (Mechanics), Deflection.
Identifiers: Spherical shells, Domes (Structural forms).

For abstract, see NSA 23 23.
SCL-RR-69-80 HC$3.00 MF$0.65

20L. Solid-State Physics

ON THE THEORY OF ABSORPTION OF INFRARED RAYS BY NONIDEAL ION CRYSTALS,
Foreign Technology Div Wright-Patterson AFB Ohio
I. P. Dzyub. 12 Sep 69, 13p Rept no. FTD-HT-23-185-68
Edited trans. of Ukrayinskyi Fizychnyi Zhurnal (USSR) v11 n7 p752-758 1966, by L. Marokus.

Descriptors: (*Crystal lattice defects, *Infrared radiation), Absorption spectrum, Spectra (Infrared), Mathematical analysis, Ions, USSR.
Identifiers: Translations.

In the report the absorption of infrared rays by nonideal ion crystals is discussed. In the calculation it was assumed, that the power constants of the crystal do not change when an atom of an ideal lattice is replaced by an admixture atom. The form of the basic absorption band of a nonideal crystal and the integral contribution of local frequencies were determined. The width of the curve of the basic absorption band and the integral contribution of local frequencies were determined in the first order by concentration. The calculations indicate a possible quasi-resonance expansion of the basic absorption band. (Author)
AD-697 895 HC$3.00 MF$0.65

THE TEMPERATURE DEPENDENCE OF SHOCK WAVE PROPAGATION IN BRASS AND ALUMINUM,
Naval Ordnance Lab White Oak Md
Nathaniel L. Coleburn, and Jerry W. Forbes. 22 Aug 69, 35p Rept no. NOLTR-69-150

Descriptors: (*Shock waves, Propagation), (*Brass, Thermal properties), (*Aluminum alloys, Thermal properties), High-pressure research, Heating, Temperature, Anomalies, Microstructure, Compressive properties, Equations of state, Experimental design, Detonation waves, Velocity, Volume.
Identifiers: Aluminum alloy 61, Hugoniot equations, Grueneisen parameter, Chemical composition.

Measurements at initial temperatures ranging from 20C to 450C reveal an anomalous effect of preheating on shock wave propagation in brass. The shock wave velocity observed at 20C is decreased about 20% at 450C for equal incident pressures. The anomaly is attributed to a disorder-order rearrangement occurring in Cu-Zn alloys of near stoichiometric composition. Pre-heated aluminum was observed to behave normally under dynamic compression. Relations were derived for computing the variation of the Gruneisen parameter with volume using the slope and intercept of the shock velocity - particle velocity curve and the initial temperature of compression. (Author)
AD-697 931 HC$3.00 MF$0.65

OPTICAL AND ELECTRON SPIN RESONANCE STUDIES OF FOURTH NEAREST NEIGHBOR CHROMIUM ION PAIRS IN RUBY.
Technical rept.,
California Univ Santa Cruz Div of Natural Sciences
Peter L. Scott, M. J. Berggren, and G. F. Imbusch. Nov 69, 31p* Rept no. TR-1
Contract N00014-68-A-0381-0002
Prepared in cooperation with Stanford Univ., Calif. Dept. of Physics and Bell Telephone Labs., Murray Hill, N. J.

Descriptors: (*Chromium, Molecular energy levels), (*Ruby, *Molecular energy levels), (*Electron spin resonance, Ruby), Hamiltonian, Ground state, Zeeman effect, Phonons.
Identifiers: Ion pairs, Ligand fields, Spin orbit interactions.

The fine structure of the optical fluorescence spectrum arising from the fourth nearest neighbor chromium ion pair system in ruby was studied using high resolution optical spectroscopy, ordinary electron spin resonance, and optically detected electron spin resonance. The ground state energy levels of this system are found to be describable by a simple spin Hamiltonian where the directions of the symmetry axes, D (s), and E (s) each depend on the spin S in a predictable way, requiring only two adjustable parameters: D (c) (the usual second order crystal field term of axial symmetry), and D (e) (a similar term arising from the anisotropic exchange interaction). A phonon-assisted energy transfer mechanism is postulated to account for the existence of the optically detected spin resonance spectrum. (Author)
AD-697 982 HC$3.00 MF$0.65

THIN FILM CHARACTERIZATION BY ELECTRON MICROPROBE AND ELLIPSOMETRY: SiO2 FILMS ON SILICON.
Technical rept.,
Pennsylvania State Univ University Park Materials Research Lab
W. H. Knausenberger, K. Vedam, E. W. White, and W. Zeigler. 13 Nov 69, 6p Rept no. TR-3
Contract N00014-67-A-0385-0002
Availability: Pub. in Applied Physics Letters, v14 n2 p1-3, 15 Jan 69.

Descriptors: (*Dielectric films, Thickness), Silicon dioxide, Optical analysis, X-ray spectroscopy.
Identifiers: Electron probes, Ellipsometry, Thin films.

A combined electron microprobe and ellipsometric study of thin SiO2 films on silicon provides a technique for compositional and morphological characterization of thin films. (Author)
AD-698 067

THE EFFECT OF TWO-MAGNON SCATTERING ON PARALLEL-PUMP INSTABILITY THRESHOLDS.
Technical rept.,
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
Jay Peter Sage. Jul 69, 126p Rept no. TR-594
Contract N00014-67-A-0298-0006

Descriptors: (*Ferromagnetic materials, Magnetic resonance), (*Magnetic moments, Interactions), Cadmium compounds, Chromium compounds, Selenides, Single crystals, Cryogenics, Theses.
Identifiers: Cadmium chromium selenides, Two magnon scattering, Heisenberg model, Magnons.

Following a general description of the important properties and symmetries of the parallel-pump coupling and of two-magnon scattering, several theoretical approaches to the problem of the effect of two-magnon scattering on the parallel-pump instability threshold are explored. A successful approach, based on the rate of energy flow among the spinwave modes and involving only elementary mathematical tools, is developed. Extensive experimental data on the wave vector dependence of delta H sub k over a wide range of temperatures in ferromagnetic CdCr2Se4 are also presented. Results of theoretical calculations at several temperatures are compared with these data, and interesting information about spinwave renormalization and the dominant multimagnon scattering mechanisms at temperatures up to about 90% of the Curie temperature is obtained. (Author)
AD-698 123 HC$3.00 MF$0.65

TREATMENT OF PAIRING IN MANY-BODY SYSTEMS BY AN EQUATION-OF-MOTION METHOD.
Arizona Univ Tucson Dept of Physics
For primary bibliographic entry see Field 20J.
AD-698 149 HC$3.00 MF$0.65

PAIRING TREATMENT OF INTERACTING LOCALIZED MOMENTS IN DILUTE MAGNETIC ALLOYS.
Technical rept.,
Arizona Univ Tucson Dept of Physics
R. H. Parmenter. 21 Nov 69, 35p Rept no. TR-3
Contract N00014-67-A-0209-0007

Descriptors: (*Magnetic alloys, Band theory of solids), (*Magnetic moments, Interactions), Ferromagnetic materials, Paramagnetic materials, Equations of motion, Impurities.
Identifiers: Anderson model, Elementary excitations, Electron spin.

The Anderson model of a localized magnetic center is used to study a system of interacting localized moments in a dilute magnetic alloy. The effective interaction between centers, mediated by the conduction electrons, causes the localized quasiparticle energies to spread and lower by an amount proportional to the square root of n sub 0 (n sub 0 being the density of centers). The proportionality factor is greater, by a factor of the square root of 2, in the ferromagnetic state than in the paramagnetic state. Near these localized quasiparticle energies are gaps in the conduction-band quasiparticle spectrum, the gaps being proportional to the cube root of n sub 0. With the exception of the immediate vicinity of these gaps, the conduction-band quasiparticle spectrum is spread and shifted by an amount proportional to n sub 0. These results are obtained by an equation-of-motion method that includes hole-electron pairing of a certain type. The latter allows one the flexibility of leaving unspecified the spin orientation of the electron occupying any given single-particle orbital. (Author)
AD-698 150 HC$3.00 MF$0.65

THERMAL CONDUCTIVITY MEASUREMENTS OF SEMICONDUCTORS.
Final rept.,
South Dakota School of Mines and Technology Rapid City Dept of Physics
R. Daniel Redin. 15 Nov 69, 13p Rept no. F2964
Contract Nonr-2964 (01)

Descriptors: (*Semiconductors, *Thermal conductivity), Indium antimonides, Magnesium alloys, Tin alloys, Bismuth compounds, Europium compounds, Sodium compounds, Intermetallic compounds, Oxides, Sulfides, Tellurides, Tungstates, Silicon, Measurement.
Identifiers: Bismuth sulfide tellurides, Bismuth tellurides, Europium oxides, Magnesium tin, Sodium tungstates, Ferromagnetic semiconductors, Tin intermetallics.

A brief summary of work accomplished in thermal conductivity measurements of Si, InSb, NaxW03, Bi2Te3, Bi8Te7S5, and Mg2Sn above room temperature and Si, InSb, and EuO below room temperature is presented together with a list of publications and reports. (Author)

AD-698 154 HC$3.00 MF$0.65

MANY-BODY EFFECTS IN THE OPTICAL PROPERTIES OF SODIUM AND POTASSIUM.
Technical rept.,
California Univ San Diego La Jolla Dept of Physics
Chian-Yuan Young. 10 Mar 69, 9p Rept no. TR-1
Contract N00014-69-A-0200-6001
Availability: Pub. in Physical Review, v183 n3 p627-633, 15 Jul 69.

Descriptors: (*Band theory of solids, N-body problem), (*Sodium, Optical properties), (*Potassium, Optical properties), Perturbation theory, Electrons, Phonons, Theses.
Identifiers: Electron electron interactions.

The influence of the electron-electron interaction on the optical properties of sodium and potassium were calculated by perturbation theory. Enhancements of the interband absorption by 42 and 49% were found for sodium and potassium, respectively, which are, however, much less drastic than previous estimates by Overhauser. The calculation shows no indication of the anomalous absorption structure in the experiments of Mayer and co-workers. (Author)
AD-698 214

INVESTIGATION OF THE GUNN EFFECT IN GALLIUM ARSENIDE.
Master's thesis,
Naval Postgraduate School, Monterey, Calif.
Alois Allen Slepicka. May 66, 74p
Distribution Limitation now Removed.

Descriptors: (*Microwave oscillators, *Gallium arsenides), (*Diodes (Semiconductor), *Microwave amplifiers), Electric fields, Impedance matching, Pulse generators, Electric currents, Voltage, Electron density, Vacuum apparatus, Graphite, Cavity resonators, Single crystals, Varactor diodes, Hysteresis, Indium compounds, Phosphides, Resistance (Electrical), Doping, Carriers (Semiconductors), Theses.
Identifiers: *Gunn effect, Conduction band (semiconductors).

The Gunn effect is a recently (1963) observed phenomenon in the electrical properties of certain compound semiconductors. It is characterized by a sudden onset of oscillations in current through the material when a critical value of electric field is exceeded. The oscillations are not greatly affected by external circuit conditions, are at microwave frequencies, and occur as a bulk property at room temperature in gallium arsenide and certain other materials with the proper conduction band structure. The intervalley transfer of electrons in the conduction band from a lower energy high mobility sub-band, to a higher energy low mobility sub-band with the application of an increasing electric field gives rise to a negative differential resistance in the material. It is this mechanism which is accepted as the cause of the instabilities. A brief theoretical explanation is given. The preparation of samples of gallium arsenide is described and discussed. Sample mounting is described, and the results of various tests reported. The value of the effect lies in the ability to directly convert pulse of DC power into microwave power at usable levels and at reasonable efficiencies. (Author)
AD-800 479 HC$3.00 MF$0.65

PHOTOCONDUCTOR-SEMICONDUCTOR EMITTERS.
Quarterly rept. no. 6, 1 Oct 66-1 Jan 67,
Stanford Research Inst., Menlo Park, Calif.
Donovan V. Geppert, Burnell V. Dore, Richard S. Muller, Robert A. Mueller, and William E. Spicer. Jan 67, 40p
Contract DA-44-009-AMC-1206 (T)
See also Quarterly rept. no. 3, AD-482 050. Distribution Limitation now Removed.

Descriptors: (*Photocathodes, Barium compounds), (*Photoelectric materials, Work functions), Photoelectric effect, Semiconductors, Oxides, Photons, Photoconductivity, Infrared photoconductors.
Identifiers: Barium oxides.

New laboratory facilities recently completed and now in full operation, are described. Measurements were made of photoelectric work function as a function of BaO film thickness; these measurements corroborate previously reported data. It has been demonstrated that continued evaporation of BaO onto a heated substrate results in a reduction in the photoelectric work function below that obtained for an optimum film thickness of 10 to 15 monolayers. The emission near threshold is believed to be photoemission from levels in the BaO itself; at higher energy values above about 1.35 eV, the emission is believed to originate in the metal substrate. It was demonstrated that moderately high external fields reduce the photoelectric work function and increase the quantum efficiency. A similar effect has been observed by shining white light onto the photocathode. The enhancement of photoemission owing to electron bombardment of the BaO was observed again for thin BaO films; however, the effect was not observed for thick films. The enhanced photoemission of a heated photo cathode reported previously was noted again (this time with thick BaO films), and this effect was studied intensively. The emission at the higher temperatures appears to originate from conduction-band electrons in the BaO, inasmuch as the threshold energy is only 0.6 eV, the electron affinity of BaO. (Author)
AD-809 036 HC$3.00 MF$0.65

SENSITIVITY OF NUCLEAR MAGNETIC DOUBLE RESONANCE,
Illinois Univ., Urbana.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 23 23.
COO-1198-663 HC$3.00 MF$0.65

THERMAL EXPANSION AND PHONON FREQUENCY SHIFTS IN NON-PRIMITIVE LATTICES,
Gulf General Atomic, Inc., San Diego, Calif.
E. Leo Slaggie. 1969, 56p
Contract AT (04-3)-167

Descriptors: (*Crystal lattices, Thermal expansion), (*Reactor moderators, Phonons), (*Phonons, Frequency shift), Zirconium compounds, Hydrides.
Identifiers: Zirconium hydrides, Lattice vibrations, Phonon frequency shift.

For abstract, see NSA 23 23.
GA-9417 HC$3.00 MF$0.65

25 YEARS OF RARE EARTHS. A BIBLIOGRAPHY OF RARE-EARTH RESEARCH PAPERS AND REPORTS PUBLISHED BY THE AMES LABORATORY FROM ITS FOUNDING TO ITS 25TH ANNIVERSARY,
Ames Lab., Iowa.
For primary bibliographic entry see Field 7B.
For abstract, see NSA 23 23.
IS-RIC-2 HC$3.00 MF$0.65

LATTICE DYNAMICS OF SCANDIUM.
Doctoral thesis,
Ames Lab., Iowa.
Nobuyoshi Wakabayashi. Aug 69, 124p
Contract W-7405-eng-82
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Scandium, Phonons), Band theory of solids, Wave functions, Cryogenics, Theses.
Identifiers: *Lattice vibrations, Magnetic ordering, Fermi surfaces, Magnons.

For abstract, see NSA 23 23.
IS-T-322 HC$3.00 MF$0.65

IONIC DOMAIN FOR YTTRIA DOPED THORIA AT LOW OXYGEN POTENTIALS.
Master's thesis,
Ames Lab., Iowa.
John Benjamin Hardaway, III. Aug 69, 41p
Contract W-7405-eng-82

Descriptors: (*Refractory materials, *Thorium compounds), Doping, Oxides, Ceramic materials, Yttrium compounds, Theses.
Identifiers: *Yttrium oxides, *Thorium oxides, Metal oxides.

For abstract, see NSA 23 23.
IS-T-333 HC$3.00 MF$0.65

SOME APPLICATIONS OF THE JOSEPHSON EFFECT.
Technical note,
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
R. A. Kamper, L. O. Mullen, and D. B. Sullivan. Oct 69, 71p*
Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.65.

Descriptors: (*Superconductors, *Tunneling (Electronics)), (*Thermometers, Cryogenics), Nuclear magnetic resonance, Metal films, Niobium, Lead.
Identifiers: *Josephson junctions, Noise thermometers.

Techniques are described for fabricating permanent Josephson junctions between thin films of niobium and lead, and for absolute noise thermometry at very low temperatures using the Josephson effect. The possible benefits of applying superconductivity to nuclear magnetic resonance detection are discussed and other applications of the Josephson effect are reviewed.
NBS-TN-381 HC$0.65 MF$0.65

IONIC CONDUCTIVITY OF LANTHANUM FLUORIDE.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
W. L. Fielder. Oct 69, 16p NASA-TN-D-5505
Contract 120-34

Descriptors: *Electrical resistivity, *Impurities, *Lanthanum fluorides, *Single crystals, Calcium compounds, Crystal defects.

For abstract, see STAR 07 24.
N69-40056 HC$3.00 MF$0.65

DEPOSITION AND EVALUATION OF SILICON FILMS FORMED BY PYROLYTIC DECOMPOSITION OF SILANE ON OXIDIZED SILICON SINGLE CRYSTALS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A. L. Fripp, Jr.. Jun 69, 68p NASA-TM-X-61916

Descriptors: *Crystal structure, *Deposition, *Silicon films, *Temperature effects, Polycrystals, Semiconducting films, Silanes, Single crystals, Substrates.

For abstract, see STAR 07 24.
N69-40102 HC$3.00 MF$0.65

VAPOR PHASE GROWTH TECHNIQUE AND SYSTEM FOR SEVERAL 3-5 COMPOUND SEMICONDUCTORS QUARTERLY TECHNICAL REPORT.
Radio Corp. of America, Princeton, N. J.
R. Clough, A. B. Dreeben, R. E. Enstrom, and J. J. Tietjen. Jun 69, 14p NASA-CR-106371, QTR-7
Contract NAS12-538

Descriptors: *Group 3a compounds, *Group 5a compounds, *Growth, *Semiconductors (materials), *Vapor phases, Additives, Alloys, Diffusion, Flow velocity, High temperature.

For abstract, see STAR 07 24.
N69-40423 HC$3.00 MF$0.65

THE INFLUENCE OF HYDROSTATIC PRESSURE ON DIFFUSION IN METALS HAVING A CUBIC STRUCTURE.
Contribution A l'Etude de l'Influence de La Pression Hydrostatique Sur La Diffusion Dans les Metaux Cubiques
Commissariat A L Energie Atomique, Saclay (France). Centre D Etudes Nucleaires.
M. Beyeler. Jul 69, 134p CEA-R-3715
Lang- in French, English Summary

Descriptors: *Body centered cubic lattices, *Diffusion, *Face centered cubic lattices, *Hydrostatic pressure, Activation, Aluminum, Bibliographies, Entropy, Vacancies (crystal defects).

For abstract, see STAR 07 24.
N69-40511 HC$3.00 MF$0.65

CHARACTERISTICS OF AVALANCHE DISCHARGE CHANNELS IN SILICON P-N LAYERS.
Eigenschaften Von Lawinenentladungskanaelen in Silizium-pn-schichten
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Maschinenwesen Und Elektrotechnik.
H. Bernt. 1968, 30p
Lang- in German

Descriptors: *Avalanche diodes, *Electrical properties, *P-n junctions, *Silicon radiation detectors, Charge carriers, Charge transfer, Geiger counters, Overvoltage.

For abstract, see STAR 07 24.
N69-40619 HC$3.00 MF$0.65

LAYER MODEL OF SELENIUM SINGLE CRYSTALS.
Helsinki Univ. (Finland). Electronics Lab.
For primary bibliographic entry see Field 20B.
For abstract, see STAR 07 24.
N69-40716 HC$3.00 MF$0.65

STUDY OF DOPANTS FOR RADIATION-RESISTANT SILICON QUARTERLY REPORT.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
Northrop Corporate Labs., Hawthorne, Calif.
Oct 69, 16p NASA-CR-106381, NCL-69-52R
Contracts NAS7-100, JPL-952523
Prep- Prepared for Jpl

Descriptors: *Additives, *Aluminum, *Lithium, *Radiation tolerance, *Silicon compounds, Crystal defects, Particle diffusion, Radiation effects.

For abstract, see STAR 07 24.
N69-40741 HC$3.00 MF$0.65

FUNDAMENTAL STUDIES OF THE METALLURGICAL, ELECTRICAL AND OPTICAL PROPERTIES OF GALLIUM PHOSPHIDE QUARTERLY PROGRESS REPORT, 1 JUL. - 30 SEP. 1969.
Stanford Univ., Calif. Solid-state Electronics Labs.
30 Sep 69, 5p NASA-CR-106399
Contract NGR-05-020-043

Descriptors: *Gallium phosphides, *Germanium alloys, *High temperature research, *Semiconductor devices, Alloys, Nickel alloys, Surface temperature, Vapor deposition.

For abstract, see STAR 07 24.
N69-40825 HC$3.00 MF$0.65

ULTRASONIC DAMPING IN EXCHANGE-REINFORCED METALS FOR T EQUALS 0 AND IN FERROMAGNETS FOR TEMPERATURE GREATER THAN CRITICAL TEMPERATURE IN THE BAND MODEL.
Zur Ultraschalldaempfung in Austauschverstaerkten Metallen Fuer T Equals O Und in Ferromagneten Fuer T Greater Than T Sub C Im Baendfrmodell
Technische Hochschule Munchen (West Germany).
K. Gehring. 1969, 26p
Lang- in German

Descriptors: *Conduction bands, *Critical temperature, *Ferromagnetic materials, *Landau damping, *Metals, *Ultrasonic radiation, Band structure of solids, Conduction electrons, Electron spin, Spin resonance.

For abstract, see STAR 07 24.
N69-40839 HC$3.00 MF$0.65

STUDIES OF THE NONLINEAR OPTICS OF STIMULATED BRILLOUIN SCATTERING AND INDUCED TRANSPARENCE IN THE WAVELENGTH RANGE AT 10 MU.
Untersuchungen Zur Nichtlinearen Optik Stimulierte Brillouin-streuung Und Induzierte Transparenz Im Wellenlaengenbereich Bei 10 Mu
Technische Hochschule Munchen (West Germany).
P.-M. Asam. 1969, 129p
Lang- in German

Descriptors: *Brillouin effect, *Carbon dioxide lasers, *Germanium, *Methane, *Transparence, Gas lasers, Light scattering, Optical properties.

For abstract, see STAR 07 24.
N69-41038 HC$3.00 MF$0.65

THE CONDUCTION MECHANISM IN MONOCRYSTALLINE SELENIUM.
State Inst. for Technical Research, Helsinki (Finland).
J. Heleskivi, T. Salo, and T. Stubb. 1969, 15p
Conf- Presented At the 3d Nordic Solid State Conf., Copenhagen, 1968 Spon- Supported By the European Selenium-tellurium Comm. Seri- Its Julkaisu Publ-147

Descriptors: *Conduction bands, *Selenium, *Single crystals, Hall effect, Impurities, Low temperature, Mathematical models, Room temperature, Semiconductors (materials).

For abstract, see STAR 07 24.
N69-41237 HC$3.00 MF$0.65

CALCULATION OF THE RADIATION DOSE IN THE INTERIOR OF A SATELLITE WITH CONSIDERATION OF THE STRUCTURE OF THE SATELLITE AND THE ANGULAR DISTRIBUTION OF THE RADIATION,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 22B.
For abstract, see NSA 23 23.
ORNL-tr-2201 HC$3.00 MF$0.65

A PHYSICO-CHEMICAL STUDY OF SOME AREAS OF FUNDAMENTAL SIGNIFICANCE TO BIOPHYSICS.
Louisiana State Univ., Baton Rouge.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 23 23.
ORO-3018-53 HC$3.00 MF$0.65

EFFECT OF HYDROSTATIC PRESSURE ON THE IONIC CONDUCTIVITY AND SELF-DIFFUSION IN SINGLE CRYSTALS OF AgCl AND AgCl+ CdCl2 Deistvie Gidrostaticheskogo Davleniya na lonnuyu Provodimost i Samodiffuziyu v Monokristallakh AgCl i AgCl+ CdCl2),
California Univ., Berkeley. Lawrence Radiation Lab.
B. G. Lure, A. N. Murin, and I. V. Murin. Aug 69, 18p UCRL-Trans-10382
Trans. of Trans. of Leningrad Univ. Vestnik (USSR) v23 n22, Seriya Fiziki i Khimii, n4 p131-138 1968, by A. M. A. Mincer.

Descriptors: (*Silver compounds, Solid state physics), Single crystals, Chlorides, Electrical conductance, Diffusion, Doping, Cadmium compounds, Impurities, USSR.
Identifiers: *Silver chloride, Electron mobility, Cadmium chloride.

The conductivity and self-diffusion coefficients for Ag (+) and Cd (+2) cations in AgCl single crystals (pure and doped with CdCl2) have been studied and determined for the temperature range from 200 C to 350 C the pressures being up to 7000 atm. The defect concentrations, mobilities and activation volumes have been determined. The results are discussed in terms of the Zener's continual model using the Gruneizen's approximation. The experimental data are considered to be in good agreements with the theory. (Author)
PB-188 148T HC$3.00 MF$0.65

THE JOSEPHSON EFFECT,
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
Robert A. Kamper. 5 May 69, 5p* R-544
Revision of report dated 14 Mar 69. Presented at the Solid State Sensors Symposium, Minneapolis, Minn., 12-13 Sep 68. Pub. in IEEE Transactions on Electron Devices, VED-16 n10 p840-844 Oct 69.

Descriptors: (*Superconductors, *Tunneling (Electronics)), Magnetometers, Ammeters, Voltmeters, Thermometers, Reviews.
Identifiers: *Josephson junctions.

The publication is a review of the Josephson effect in superconductors, with emphasis on the electrical properties of Josephson junctions and their application to devices and measurement techniques. (Author)
PB-188 205 HC$3.00 MF$0.65

A MEMOIR OF RUSSELL B. SCOTT,
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
Victor J. Johnson. 1968, 13p R-525
Pub. in Applications of Cryogenic Technology. Proceedings of the CRYO/68 Conference, Chicago, Ill., 9-12 Jun 68, p1-11.

Descriptors: (*Scientific personnel, Reviews), Cryogenics.
Identifiers: *Scott Russell Burton, Biographies.

The paper presents a review of the career of Mr. Russell B. Scott, cryogenic physicist and cryogenic engineer at the National Bureau of Standards from 1928 to 1965. The memoir includes a brief description of his early home, family, and education and of the first twenty-two years of his professional life at NBS in Washington in the Low Temperature Physics Laboratory. His career in conjunction with the development of the cryogenic industry is discussed in greater detail, as is the recognition he received as a cryogenic engineer and as Manager of the Boulder Laboratories. (Author)
PB-188 223 HC$3.00 MF$0.65

SOLID MECHANICS WITH APPLICATIONS TO PRESSURIZED WATER REACTORS,
Bettis Atomic Power Lab., Pittsburgh, Pa.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
WAPD-TM-762 HC$3.00 MF$0.65

20M. Thermodynamics

ACCURACY OF DIFFERENTIAL APPROXIMATION FOR RADIATIVE IONIZATION IN COLD PRECURSOR OF AXISYMMETRIC DETACHED SHOCK,
Brown Univ Providence R I Div of Engineering
For primary bibliographic entry see Field 20I.
AD-697 974 HC$3.00 MF$0.65

THE TEMPERATURE DEPENDENCE OF THE THERMAL CONTACT RESISTANCE ACROSS NONMETALLIC INTERFACES.
Technical rept. 1 Jun 66-1 Oct 68,
Air Force Materials Lab Wright-Patterson AFB Ohio
Merrill L. Minges. Oct 69, 166p Rept no. AFML-TR-69-1
See also AFML-TR-65-375-Vol-1 dated Apr 66, AD-482 633. Supersedes AFML-TR-65-375 Volume 2 and Volume 3.

Descriptors: (*Interfaces, Non-metals), (*Heat transfer, Interfaces), Joints, Surface roughness, High-temperature research, Ceramic materials, Compressive properties, Beryllium oxides, Tantalum, Experimental data, Thermal conductivity, Brittleness, Heat flux, Transport properties, Thermal analysis, Thermal insulation, Alumina, Experimental design, Test equipment, Boundary value problems, Mathematical prediction, Numerical analysis.
Identifiers: *Thermal contact resistance.

Extensive measurements of thermal contact resistance were conducted in the following study areas, where no previous systematic measurements have been performed: (1) interfaces consisting of brittle, nonmetallic components, and (2) radiative transport across the interface at high temperatures. An apparatus for performing the measurements to elevated temperatures was designed, constructed, and performance tested. The equipment, operated in vacuum environments, utilized tantalum heaters to develop heat flow down a specimen column which was water cooled at its base. The contact resistance specimen column consisted of two high purity beryllium oxide cylinders, 1 inch in diameter and 1.5 inches in length. The successful performance of the apparatus was demonstrated by measuring the thermal conductivity of beryllium oxide and tantalum as a function of temperature. Analytical predictions of heat losses from the specimen column were made through solution of the boundary-value problem for the temperature field in the insulation segment surrounding this column. The results compared favorably with experimental heat loss measurements. (Author)
AD-697 988 HC$3.00 MF$0.65

A BIBLIOGRAPHY OF THERMOPHYSICAL PROPERTIES OF AIR FROM 0 TO 300 K,
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
For primary bibliographic entry see Field 7D.
NBS-TN-383 HC$1.25 MF$0.65

HEAT TRANSFER AND HYDRAULICS: THE EFFECTS OF SUBCOOLED VOIDS.
Final rept., Feb-67-Jun 69,
General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
F. W. Staub, and G. E. Walmet. May 69, 253p
EURAEC-2120
Contract AT (30-1)-3679

Descriptors: (*Heat exchangers, Hydraulic systems), Heat transfer.

For abstract, see NSA 23 23.
NYO-3679-8 HC$3.00 MF$0.65

SPACE THERMAL CONTROL BY FREEZING AND MELTING INTERIM REPORT.
Lockheed Missiles and Space Co., Huntsville, Ala. Research and Engineering Center.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 07 24.
N69-40104 HC$3.00 MF$0.65

FORCED CONVECTION OF AMMONIA. PART 2 - GASEOUS AMMONIA, VERY HIGH WALL TEMPERATURES (1000 TO 3000 DEG K).
Convection Forcee de l'Ammoniac. Deuxieme Partie - Ammoniac Gazeux, Cas de Tres Hautes Temperatures de Paroi (1000 A 3000 Deg K)
Commissariat A L Energie Atomique, Grenoble (France). Centre D Etudes Nucleaires.
P. Perroud, J. Rebiere, and R. Strittmatter. Jun 69, 120p CEA-R-3728
Lang- in French, English Summary Prep- Prepared Jointly With Direc. des Rech. Et Moyens D'essais

Descriptors: *Ammonia, *Convective heat transfer, *Forced convection, *High temperature tests, *Wall temperature, Free convection, Gas dissociation, Gaseous diffusion, Heat transfer coefficients, Tables (data), Temperature gradients, Thermal dissociation, Thermal expansion, Tungsten.

For abstract, see STAR 07 24.
N69-40267 HC$3.00 MF$0.65

PENETRATION MODEL EXPLANATION FOR TURBULENT FORCED-CONVECTION HEAT TRANSFER OBSERVED IN NEAR-CRITICAL FLUIDS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
R. W. Graham. Oct 69, 31p NASA-TN-D-5522
Contract 129-01

Descriptors: *Convective heat transfer, *Critical temperature, *Forced convection, *Turbulent heat transfer, Boiling, Critical point, Mathematical models.

For abstract, see STAR 07 24.
N69-40437 HC$3.00 MF$0.65

A COMPREHENSIVE PROGRAM FOR THE COMPILATION AND ANALYSIS OF THERMAL RADIATIVE PROPERTIES DATA.
Purdue Univ., Lafayette, Ind. Thermophysical Properties Research Center.
D. P. De Witt, R. S. Hernicz, and M. C. Muinzer.
Sep 69, 126p NASA-CR-1431
Contract NSR-15-005-037
Coll- 126 P Refs

Descriptors: *Graphs (charts), *Tables (data), *Thermal radiation, Absorption spectra.

For abstract, see STAR 07 24.
N69-40455 HC$3.00 MF$0.65

CONVECTIVE HEAT-TRANSFER RATES ON LARGE-ANGLE CONICAL BODIES AT HYPERSONIC SPEEDS.
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
J. G. Marvin, and D. A. Stewart. Nov 69, 16p
NASA-TN-D-5526
Contract 124-07-02-32-00-21

Descriptors: *Conical bodies, *Convective heat transfer, *Heat transfer coefficients, *Hypersonic speed, Angle of attack, Blunt bodies.

For abstract, see STAR 07 24.
N69-40780 HC$3.00 MF$0.65

CONVECTIVE HEAT-TRANSFER COEFFICIENTS FROM A SOLUTION OF THE CONDUCTION EQUATION FOR A WALL SEPARATING TWO FLUIDS, ONE HAVING AN OSCILLATING TEMPERATURE.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
R. G. Huff. Oct 69, 84p NASA-TN-D-5520
Contract 122-29

Descriptors: *Convective heat transfer, *Heat transfer coefficients, *Wall temperature, Conductive heat transfer, Graphs (charts), Heat transmission, Mathematical models.

For abstract, see STAR 07 24.
N69-40789 HC$3.00 MF$0.65

WUNDEE - A ONE-DIMENSIONAL RADIAL HEAT- TRANSFER COMPUTER PROGRAM FOR CONDUCTIVE AND RADIATIVE HEAT-TRANSFER SITUATIONS SUCH AS ARE MET IN REACTOR RIGS OF CYLINDRICAL FORM.
United Kingdom Atomic Energy Authority, Harwell (England). Atomic Energy Research Establishment.
For primary bibliographic entry see Field 18K.
For abstract, see STAR 07 24.
N69-40959 HC$3.00 MF$0.65

COOLANT PASSAGE FIN HEAT TRANSFER AND PRESSURE DROP PERFORMANCE.
Airesearch Mfg. Co., Los Angeles, Calif.
F. M. Walters. 7 Aug 69, 35p NASA-CR-66844, AP-69-5348
Contract NAS1-6666

Descriptors: *Aircraft engines, *Cooling fins, *Cooling systems, *Heat transfer, *Hypersonic speed, *Nondestructive tests, *Pressure drop, Coolants, Flow distribution, Hydrogen, Leading edges.

For abstract, see STAR 07 24.
N69-41183 HC$3.00 MF$0.65

CONTRIBUTIONS TO THE SPECIFIC HEAT CAPACITY OF NICKEL, IRON, AND THE ALLOY Ni3Fe.
Doctoral thesis,
Oak Ridge National Lab., Tenn.
Thomas Gilman Kollie. Dec 69, 276p ORNL-TM-2649
Contract W-7405-eng-26

Descriptors: (*Nickel, Specific heat), (*Iron, Specific heat), Nickel alloys, Iron alloys, Intermetallic compounds, Calorimeters, Theses.
Identifiers: *Iron nickel, Iron intermetallic, Nickel intermetallics.

Specific heat capacity measurements performed in one of two pulse calorimeters are presented for iron, nickel, and ordered and disordered Ni3Fe from 300 to 1400 K. A pulse calorimeter developed during the research is described in detail.
PB-188 138 HC$3.00 MF$0.65

HEAT AND MASS TRANSFER IN DISPERSED, TWO-PHASE, SINGLE-COMPONENT FLOW,
Colorado Univ., Boulder.
For primary bibliographic entry see Field 20D.
PB-188 212

HEAT TRANSFER TO SOLID-VAPOR MIXTURES OF CRYOGENS BELOW THEIR TRIPLE POINTS FLOWING THROUGH HEATED TUBES,
Garrett Corp., Los Angeles, Calif. AiResearch Mfg. Div.
A. U. Simpson, M. C. Jones, and Patricia J. Giarratano. 5 Aug 68, 8p NBS-R-541
Revision of report dated 10 May 68. Pub. in American Institute of Chemical Engineers Jnl., v15 n6 p890-897 Nov 69.

Descriptors: (*Cryogenic propellants, *Heat transfer), Two-phase flow, Mixtures, Pipes, Boundary layer, Particles, Hydrogen, Nitrogen.

Data are presented for wall temperatures and heat transfer coefficients for solid-vapor mixtures of parahydrogen and nitgrogen flowing in an electrically heated straight tube of length 40 times its diameter. These are interpreted by the application of flat plate, constant property boundary-layer theory to models in which the solid particle geometrical distribution takes on simple limiting forms. The observed enhancement of the heat transfer coefficient over that for gas alone traveling at the same velocity is qualitatively predicted as a function of a dimensionless heat flux, the Sterman parameter. (Author)
PB-188 213

THERMAL DIFFUSIVITY OF POWDER INSULATION. (F-4),
Colorado Univ., Boulder.
B. L. Knight, K. D. Timmerhaus, and R. H. Kropschot. 1968, 6p NBS-R-530
Pub. in Advances in Cryogenic Engineering, v14 p224-229, Proceedings of the Cryogenic Engineering Conference, Cleveland, Ohio, 19-21 Aug 68.

Descriptors: (*Cryogenics, Thermal insulation), (*Thermal insulation, Powders), Thermal diffusion, Transients, Carbon, Silicon compounds, Thermal conductivity.

The steady-state heat flux into a cryogenic vessel is determined by the thermal conductivity of the insulating material. In addition to knowing the steady-state flux, it is frequently important to know how long it takes to approach equilibrium after the vessel is filled with liquid. The transient behavior is determined by the thermal diffusivity of the insulation and, as far as is known, has not been measured for powders commonly used for cryogenic insulations. Studies have, therefore, been made of the transient behavior of such powders as carbon, silica-magnesia, and a silica-aluminum mixture. The diffusivity obtained in these studies is temperature dependant, and with reasonable assumptions about the temperature dependence of the specific heat the derived values of thermal conductivity are in fairly good agreement with steady-state values. The mathematical representation of the transient behavior of insulating materials having a temperature-dependent diffusivity and conductivity has not been solved in closed form. A computer solution for special cases has, however, been obtained which will enable prediction of cooldown times for cryogenic storage vessels. (Author)
PB-188 218

STATISTICAL THERMODYNAMICS OF SIMPLE LIQUID MIXTURES: HENRY'S CONSTANTS,
California Univ., Berkeley. Dept. of Chemical Engineering.
R. C. Miller, and J. M. Prausnitz. 20 Mar 69, 4p R-524 NBS-R-524
Revision of report dated 25 Jan 68. Sponsored in part by National Science Foundation, Washington, D.C. Pub. in I AND EC Fundamentals, v8 n3 p449-452 Aug 69.

Descriptors: (*Liquids, *Statistical mechanics), (*Thermodynamics, Liquids), Solutions, Mixtures, Molecular association, Temperature.

The cell-theory partition function of Eckert and Renon is useful for calculating Henry's constants for solutes, if the temperature is well below the solute's critical temperature. However, the cell theory cannot reproduce the experimentally observed maximum in Henry's constant at a temperature well above the solute's critical temperature. For higher temperatures a new partition function is presented, based on a modified van der Waals model for the behavior of the supercritical solute in the liquid state. Calculations of Henry's constants for several binary mixtures illustrate the new formulation. (Author)
PB-188 224

COMPUTER PROGRAMS FOR AN IMPROVED EQUATION OF STATE (ES68Z AND ES68M),
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 23 23.
UCRL-19011 HC$3.00 MF$0.65

20N. Wave Propagation

A THEOREM ON ELECTROMAGNETIC FIELDS IN SPHERICALLY STRATIFIED MEDIA,
Michigan Univ Ann Arbor Radiation Lab
P. L. E. Uslenghi. 27 Jan 69, 2p
Contract F19628-68-C-0071
Availability: Pub. in Alta Frequenza, v38 n8 p642-236E-237-643 1969.

Descriptors: (*Electromagnetic fields, Spheres), Backscattering, Dielectric properties, Magnetic properties, Boundary value problems, Theorems.

The electric permittivity and the magnetic permeability of a spherically stratified medium, for which the radial eigenfunctions of the TE and TM modes can be determined by solving the same differential equation, are derived. As a consequence, the calculation of the backscattering cross section of an inhomogeneous sphere is considerably simplified. (Author)
AD-697 893

ECAC/RADC DATA CONVERSION FOR INTERFERENCE PREDICTION.
Final rept.,
Rome Air Development Center Griffiss AFB N Y
Gerard T. Capraro, and John H. Edwards, Jr. Nov 69, 84p Rept no. RADC-TR-69-386

Descriptors: (*Electromagnetic compatibility, Computer programs), (*Interference, Data processing systems), Predictions, Subroutines.

The report describes an in-house study to provide the Rome Air Development Center Interference Prediction Process (IPP-1) with the data collected by the Electromagnetic Compatibility Analysis Center (ECAC). Specifically, a computer program to convert the ECAC electromagnetic environmental tape files was written and is presented in detail. The program converts binary represented variables generated on a UNIVAC 1107/8 Computer to a format acceptable to the GE 635/645 computer. A general description of the computer program with the specific information necessary for the construction of such a program using the JOVIAL language is presented. This program is easy to modify with a minimum amount of programming experience. The routines described will be useful to engineers with similar problems in compatible data tape conversions. (Author)
AD-697 957 HC$3.00 MF$0.65

PROPAGATION OF RADIO WAVES,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 17B.
AD-698 104 HC$3.00 MF$0.65

LONG RANGE PROPAGATION OF SPHERICAL SHOCKWAVES FROM EXPLOSIONS IN AIR,
Naval Ordnance Lab White Oak Md
For primary bibliographic entry see Field 19D.
AD-698 121 HC$3.00 MF$0.65

THE ANALYSIS OF INTERFERENCE TO PHASE AND FREQUENCY FEEDBACK SYSTEMS.
IIT Research Inst., Annapolis, Md.
For primary bibliographic entry see Field 9E.
AD-810 164 HC$3.00 MF$0.65

RADIATION FROM SLOTS ON CYLINDRICAL BODIES USING GEOMETRICAL THEORY OF DIFFRACTION AND CREEPING WAVE THEORY.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
C. A. Balanis. 1969, 117p NASA-TM-X-61904

Descriptors: *Flow distribution, *Radiation distribution, *Slots, *Wedge flow, Creep analysis, Cylindrical bodies, Diffraction patterns, Numerical analysis.

For abstract, see STAR 07 24.
N69-40128 HC$3.00 MF$0.65

21. PROPULSION AND FUELS

21B. Combustion and Ignition

EFFECT OF MASS OSCILLATIONS ON THE IGNITABILITY OF A HETEROGENEOUS SYSTEM.
Interim rept.,
Stanford Research Inst Menlo Park Calif
C. M. Ablow, and H. Wise. 15 Nov 69, 18p
Contract Nonr-3415 (00)

Descriptors: (*Surface properties, *Burning rate), (*Combustion, Surfaces), Thermodynamics, Solid rocket propellants.
Identifiers: *Surface chemistry.

For a heterogeneous system with heat generation by solid-gas reaction and heat loss by conduction-convection, the mass oscillations at the interface can play an important role in ignition. A theoretical analysis was carried out for such a system in which the ignition process was defined in terms of a reaction mechanism involving transition from kinetic to diffusive control. In a numerical example it was shown how the ignitability of a system varies with initial temperature, oscillation frequency, and amplitude. The analysis offers some indication of the importance of various parameters on the ignition and extinction of an oscillating heterogeneous system. (Author)
AD-698 151 HC$3.00 MF$0.65

OXIDATION OF AMMONIA CATALYZED BY MIXED OXIDES OF COPPER AND CHROMIUM.
Stanford Research Inst Menlo Park Calif
For primary bibliographic entry see Field 7B.
AD-698 152 HC$3.00 MF$0.65

COMBUSTION STABILITY OF SINGLE SWIRL-CAN COMBUSTOR MODULES USING ASTM-A1 LIQUID FUEL.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
R. E. Jones, and R. W. Niedzwiecki. Oct 69, 28p
NASA-TN-D-5436
Contract 126-15

Descriptors: *Combustion chambers, *Fuels, *Liquids, *Stability, Flow velocity, High temperature, Low pressure, Low temperature.

For abstract, see STAR 07 24.
N69-40080 HC$3.00 MF$0.65

STUDIES OF COMBUSTION IN WELL STIRRED REACTORS - AN ANNOTATED BIBLIOGRAPHY.
Rocket Propulsion Establishment, Westcott (England).
P. T. Hinde. Mar 69, 13p AD-691706, TM-498

Descriptors: *Combustion, *Jet mixing flow, *Reaction kinetics, Adiabatic conditions, Bibliographies, Heat transfer, Nozzle flow.

For abstract, see STAR 07 24.
N69-40374 HC$3.00 MF$0.65

AN INVESTIGATION OF NONEQUILIBRIUM EFFECTS ON COMBUSTION IN SUPERSONIC STREAMS.
Purdue Univ., Lafayette, Ind.
C. A. Bryce. Jan 69, 131p NASA-CR-106356
Contract NGR-15-005-013, Grant NSG-592

Descriptors: *Combustion stability, *Nonequilibrium flow, *Supersonic combustion, *Thermodynamic efficiency, Gas mixtures, Ignition limits, Ignition temperature, Multiphase flow.

For abstract, see STAR 07 24.
N69-40454 HC$3.00 MF$0.65

A SPECTROSCOPIC INVESTIGATION OF COMBUSTION- DRIVEN SPHERICAL IMPLOSION WAVES.
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
D. E. Roberts. Sep 69, 49p AD-691701, UTIAS-TN-140
Contract AF 33/615/-5313

Descriptors: *Gas spectroscopy, *Hypervelocity projectiles, *Implosions, *Mechanical drives, *Shock waves, Combustion chambers, Explosive devices, Gas mixtures, Light gas guns, Temperature measurement.

For abstract, see STAR 07 24.
N69-40831 HC$3.00 MF$0.65

STUDY OF CATALYTIC REACTORS FOR HYDROGEN- OXYGEN IGNITION FINAL PROGRESS REPORT, 28 AUG. 1968 - 28 MAY 1969.
United Aircraft Corp., East Hartford, Conn. Research Labs.
A. S. Kesten. Jul 69, 78p NASA-CR-72567, UARL-H-910721
Contract NASW-1795

Descriptors: *Catalytic activity, *Chemical reactors, *Hydrogen, *Ignition, *Oxygen, Chemical analysis, Combustion, Computer programs, Performance prediction.

For abstract, see STAR 07 24.
N69-41244 HC$3.00 MF$0.65

21C. Electric Propulsion

PRIMARY ENERGY STORAGE AND THE SUPER FLYWHEEL.
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
For primary bibliographic entry see Field 10C.
AD-697 906 HC$3.00 MF$0.65

PERFORMANCE OF RADIATION-COOLED MAGNETOPLASMADYNAMIC ARC THRUSTORS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
D. J. Connolly, and R. J. Sovie. Oct 69, 12p NASA-TM-X-1908
Contract 120-26

Descriptors: *Arc discharges, *Performance tests, *Plasma dynamics, *Rocket engines, Plasma generators, Plasma propulsion.

For abstract, see STAR 07 24.
N69-40058 HC$3.00 MF$0.65

EXPERIMENTS ON MAGNETOPLASMADYNAMIC ENGINES WITH ROTATING CURRENT DISTRIBUTIONS.
General Dynamics/Convair, San Diego, Calif.
A. V. Larson. Jun 69, 28p NASA-CR-66803
Contract NAS1-8028

Descriptors: *Current distribution, *Electrostatic probes, *Plasma engines, Electric current, Electrodes, Ion density (concentration), Magnetohydrodynamics, Plasma propulsion, Rotating plasmas.

For abstract, see STAR 07 24.
N69-40202 HC$3.00 MF$0.65

AN ELECTRIC PROPULSION SYSTEM FOR ACHIEVING A GEOSTATIONARY ORBIT.
Un Sistema A Propulsione Elettrica Per La Di Orbite Geostazionarie
Rome Univ. (Italy). Centro Ricerche Aerospaziali.
C. Buongiorno. Sep 68, 20p REPT-19
Lang- in Italian, English Summary

Descriptors: *Electric propulsion, *Equatorial orbits, *Ion engines, *Scout project, *Stationary orbits, Boosters, Feasibility, Payloads.

For abstract, see STAR 07 24.
N69-40232 HC$3.00 MF$0.65

21D. Fuels

EFFECT OF A STATIC DISSIPATOR ADDITIVE ON THE CHARGING TENDENCY OF JET FUELS,
Naval Research Lab Washington D C
Joseph T. Leonard, and Homer W. Carhart. 12 Nov 69, 22p* Rept no. NRL-6952

Descriptors: (*Jet engine fuels, *Static discharges), (*Fuel additives, Static dischargers), Static electricity, Handling.
Identifiers: JP-4 fuel, JP-5 fuel.

The effect of a static dissipator additive on the charging tendency of both JP-4 and JP-5 type jet fuels was examined at various flow velocities on a laboratory scale. For the document's use, the term 'charging tendency' refers to the current generated by a given quantity of fuel when passing through a filter or an insulated section of piping rather than to the ability of a fuel to produce dangerously high potentials when loaded into a tank. It was found that when the conductivity of the fuel is increased by the addition of the static dissipator additive, the charging tendency also increases, passes through a maximum, and then decreases. Also, at higher flow velocities, there is an overall increase in the charging tendency of the fuel, and the position of the maximum in the charging tendency vs conductivity curve shifts to a higher conductivity range. (Author)
AD-698 119 HC$3.00 MF$0.65

HELIUM PRESSURIZATION SYSTEMS FOR LIQUID- METHANE FUEL IN SUPERSONIC TRANSPORTS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
J. D. Eisenberg. Oct 69, 44p NASA-TN-D-5519
Contract 789-50

Descriptors: *Helium, *Methane, *Pressurizing, *Supersonic aircraft, Cryogenics, Fuel systems, Payloads.

For abstract, see STAR 07 24.
N69-40329 HC$3.00 MF$0.65

21E. Jet and Gas Turbine Engines

FUEL BURNUP AND HOT-FLOW MODELING OF COMBUSTION CHAMBERS,
Foreign Technology Div Wright-Patterson AFB Ohio
Ya. P. Storozhuk, and V. A. Asoskov. 15 Aug 69, 38p Rept no. FTD-HT-23-1321-68
Edited trans. of Tsentralnyi Nauchno-Issledovatelskii i Proektno-Konstruktorskii Kotloturbinnyi Institut. Trudy (USSR) n75 p110-137 1967.

Descriptors: (*Gas turbines, *Combustion), Fuel consumption, Pressure, Temperature, Stability, Flames, Combustion chambers, USSR.
Identifiers: Translations.

To simplify the analysis of the combustion process taking place in gas turbines, it is recommended that the process be broken down into simplified stages. In the combustion of a liquid fuel, the process will consist of the following stages: (1) preheating and evaporation of the fuel droplets; (2) the mixing of the atomized fuel and its vapor with air; and (3) the chemical reaction of the fuel vapor with oxygen. In selecting and comparing thermal loads, it is necessary to consider the burnout coefficient, pressure losses and temperature fields behind the chamber, maximum temperature of the flame tube wall, the combustion stability limits, and the fuel properties. (Author)
AD-698 105 HC$3.00 MF$0.65

METHODS OF ELECTRICAL MODELLING OF THE HYDRAULIC SECTIONS OF AIR COOLING SYSTEMS OF GAS TURBINES WITH THE AID OF SERIES INTEGRATORS,
Army Foreign Science and Technology Center Washington D C
L. A. Kozdoba, A. F. Moshnyanskii, I. I. Rotav, and V. N. Chelabchi. 6 Nov 69, 22p Rept no. FSTC-HT-23-705-69
Trans. of Mashinostroenie (USSR) n4 p39-50 1967.

Descriptors: (*Gas turbines, Cooling), (*Cooling, Mathematical models), Nonlinear systems, Equations, Gas turbine rotors, Gas turbine blades, USSR.
Identifiers: Translations, Electrical models, Hydraulic models.

An analytical method is proposed for the electrical modelling of the hydraulic sections of gas turbine air cooling systems in order to permit increased efficiency through the use of higher temperatures in the working environment of turbine assemblies. The computations involved in designing a more efficient cooling system are simplified by the use of electrical models with linear impedances. (Author)
AD-698 162 HC$3.00 MF$0.65

PRELIMINARY TESTS OF A GAS TURBINE COMBUSTOR WITH AN AIR ATOMIZING FUEL INJECTOR SYSTEM.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
J. A. Bigelow. 7 Oct 69, 15p NASA-TM-X-52688

Descriptors: *Air, *Atomizers, *Combustion chambers, *Fuel injection, *Performance tests, *Turbojet engines, Feasibility, Fuel systems, Spray nozzles.

For abstract, see STAR 07 24.
N69-40754 HC$3.00 MF$0.65

PERFORMANCE OF A HERMETIC INDUCTION MOTOR- DRIVEN PUMP FOR BRAYTON CYCLE HEAT REJECTION LOOP.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
R. R. Secunde, A. C. Spagnuolo, and J. E. Vrancik. 20 Oct 69, 20p NASA-TM-X-52698

Descriptors: *Brayton cycle, *Gas turbine engines, *Heat radiators, *Turbine pumps, Engine coolants, Flow distribution, Hermetic seals, Leakage, Loops.

For abstract, see STAR 07 24.
N69-41062 HC$3.00 MF$0.65

21F. Nuclear Propulsion

N.S. SAVANNAH. CORRECTIVE ACTION ON PRIMARY PUMP CAVITY VENT PIPING FAILURE.
First Atomic Ship Transport, Inc., New York.
25 Sep 69, 2p

Descriptors: (*Nuclear powered vessels, Reactor system components), Pipes, Failure (Mechanics).
Identifiers: Savannah vessel.

For abstract, see NSA 23 23.
DOCKET-50238-50 HC$3.00 MF$0.65

A STEAM CYCLE FOR AIRCRAFT NUCLEAR PROPULSION.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
L. H. Fishback. Oct 69, 21p NASA-TM-X-1907

Contract 789-50

Descriptors: *Nuclear propulsion, *Steam flow, *Thermodynamic cycles, *Turbofan engines, Aircraft engines, Performance prediction.

For abstract, see STAR 07 24.
N69-40060 HC$3.00 MF$0.65

APPLICATIONS OF RADIOISOTOPES AND SUBLIMING MATERIALS FOR ATTITUDE CONTROL OF SMALL SOLAR PROBES.
Massachusetts Inst. of Tech., Cambridge. Center for Space Research.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 07 24.
N69-40131 HC$3.00 MF$0.65

21G. Reciprocating Engines

DEVELOPMENT OF A LABORATORY TECHNIQUE FOR DEFINING MECHANICAL SHEAR STABILITIES OF MULTI-GRADE ENGINE OILS.
Army Coating and Chemical Lab Aberdeen Proving Ground Md
For primary bibliographic entry see Field 11H.
AD-698 027 HC$3.00 MF$0.65

ON THE CALCULATION OF FORCES AND DISPLACEMENTS IN FRICTION BEARINGS OF CRANKSHAFTS WITH VARIABLE STATIC SUPPORTS.
Beitrag Zur Berechnung Der Kraefte Und Verlagerungen in Den Gleitlagern Statisch Unbestimmt Gelagerter Kurbelwellen
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Maschinenwesen Und Elektrotechnik.
E. Von Schnurbein. 1969, 93p
Lang- in German

Descriptors: *Alignment, *Ball bearings, *Internal combustion engines, *Journal bearings, *Rotating shafts, Displacement, Eccentrics, Iterative solution.

For abstract, see STAR 07 24.
N69-40840 HC$3.00 MF$0.65

21H. Rocket Motors and Engines

VECTOR THRUST LOAD CELL FEASIBILITY STUDY.
Rocketdyne Canoga Park Calif Research Div
For primary bibliographic entry see Field 14B.
AD-697 953 HC$3.00 MF$0.65

CALCULATING THE SUPERSONIC SECTION OF A LAVAL NOZZLE,
Foreign Technology Div Wright-Patterson AFB Ohio
A. Sh. Dorfman. 18 Aug 69, 16p Rept no. FTD-MT-24-172-69
Edited machine trans. of Inzhenerno-Fizicheskii Zhurnal (USSR) v4 n6 p51-57 1961.

Descriptors: (*Laval nozzles, Supersonic characteristics), Surface roughness, Walls, Numerical analysis, Supersonic nozzles, USSR.
Identifiers: Translations.

An analytical method for calculating the supersonic part of a Laval nozzle is presented. This method permits a simplification of the calculation of the supersonic part of a Laval nozzle by omitting the complicated graphical method. Nozzles with smooth walls and those with edges are considered. The analytical calculation of the supersonic part of the nozzle is done by the approximation method of S. A. Khristianovich. (Author)
AD-698 110 HC$3.00 MF$0.65

A COMPARISON OF EXPERIMENTAL HEAT-TRANSFER COEFFICIENTS IN A NOZZLE WITH ANALYTICAL PREDICTIONS FROM BARTZ'S METHODS FOR VARIOUS COMBUSTION CHAMBER PRESSURES IN A SOLID PROPELLANT ROCKET MOTOR.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
D. M. Smith. 1969, 106p NASA-TM-X-61900

Descriptors: *Heat transfer coefficients, *Solid propellant rocket engines, *Thrust chamber pressure, Boundary layer flow, Combustion efficiency, Nozzle design, Thermocouples.

For abstract, see STAR 07 24.
N69-40076 HC$3.00 MF$0.65

A STUDY OF FLUID DYNAMICS OF GASEOUS NUCLEAR ROCKETS QUARTERLY PROGRESS REPORT, 1 JUL. - 30 SEP. 1969.
Massachusetts Inst. of Tech., Cambridge.
For primary bibliographic entry see Field 20D.
For abstract, see STAR 07 24.
N69-40323 HC$3.00 MF$0.65

STERILIZABLE LIQUID PROPULSION SYSTEM, PART 1 FINAL REPORT, 5 OCT. 1966 - 31 MAR. 1968.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
Martin Marietta Corp., Denver, Colo.
F. Brady, and D. Di Stefano. Aug 68, 231p NASA-CR-106366, MCR-68-119-PT-1
Contracts NAS7-100, JPL-951709
Prep- Prepared for Jpl

Descriptors: *Ethylene oxide, *Liquid rocket propellants, *Sterilization, *Systems engineering, *Thermal cycling tests, Performance tests, Propulsion system performance, Test firing.

For abstract, see STAR 07 24.
N69-40843 HC$3.00 MF$0.65

STERILIZABLE LIQUID PROPULSION SYSTEM, PART 2 FINAL REPORT, 1 APR. 1968 - 9 MAY 1969.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
Martin Marietta Corp., Denver, Colo.
S. C. Lukens. Sep 69, 88p NASA-CR-106380, MCR-68-119-PT-2
Contracts NAS7-100, JPL-951709
Prep- Prepared for Jpl

Descriptors: *Liquid rocket propellants, *Reliability engineering, *Sterilization, *Test firing, Data acquisition, Nondestructive tests, Tables (data), Thermal cycling tests.

For abstract, see STAR 07 24.
N69-40844 HC$3.00 MF$0.65

OXYGEN DIFLUORIDE/DIBORANE TECHNOLOGY VACUUM IGNITION, PHASE 2 QUARTERLY REPORT, 15 JUL. - 14 OCT. 1969.
Thiokol Chemical Corp., Denville, N. J. Reaction Motors Div.
G. R. Mistler. 14 Oct 69, 33p NASA-CR-106369, RMD-5536-Q3
Contract NAS7-660

Descriptors: *Boranes, *Ignition systems, *Oxygen fluorides, *Rocket engines, Combustion physics, Liquid oxygen, Liquid rocket propellants, Propellant combustion, Vacuum.

For abstract, see STAR 07 24.
N69-40873 HC$3.00 MF$0.65

L M CATHODE THRUSTER SYSTEM QUARTERLY PROGRESS REPORT, 18 JUL. - 4 OCT. 1969.
Hughes Research Labs., Malibu, Calif. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
J. R. Bayless, J. Hyman, Jr., D. E. Schnelker, R. L. Seliger, and J. W. Ward. 15 Oct 69, 58p NASA-CR-106382, QPR-1
Contracts NAS7-100, JPL-952131
Prep- Prepared for Jpl

Descriptors: *Electromagnetic pumps, *Mercury (metal), *Rocket engines, *Systems engineering, Beam currents, Cathodes, High temperature, Ion extraction, Optimization.

For abstract, see STAR 07 24.
N69-40994 HC$3.00 MF$0.65

RADIATION COOLED MPD ARC THRUSTER.
Mcdonnell-douglas Co., St. Louis, Mo.
R. J. Checkley, D. W. Esker, and J. C. Kroutil. Jul 69, 103p NASA-CR-72557, MDC-H296
Contract NAS3-11518

Descriptors: *Arc discharges, *Radiant cooling, *Rocket engines, *Thrust, Ammonia, Computer programs, Mass flow, Plasma dynamics, Propulsion system performance, Specific impulse.

For abstract, see STAR 07 24.
N69-41063 HC$3.00 MF$0.65

NASA ROCKET MOTOR DEFECTS INVESTIGATION. VOLUME 1 - TECHNICAL INVESTIGATION COMPREHENSIVE REPORT, AUG. 1966 - JUN. 1968.
Hercules Powder Co., Cumberland, Md. Allegany Ballistics Lab.
R. B. Enie, and C. R. Hitt, Jr.. Jun 68, 93p NASA-CR-66813
Contract NAS1-6367

Descriptors: *Glass fibers, *Nondestructive tests, *Rocket engine cases, *Static firing, *X-248 engine, Maintenance, Quality control, Static tests.

For abstract, see STAR 07 24.
N69-41283 HC$3.00 MF$0.65

NASA ROCKET MOTOR DEFECTS INVESTIGATION. VOLUME 2 - TABLES AND FIGURES COMPREHENSIVE REPORT, AUG. 1966 - JUN. 1968.
Hercules Powder Co., Cumberland, Md. Allegany Ballistics Lab.
R. B. Enie, and C. R. Hitt, Jr.. Jun 68, 195p NASA-CR-66814
Contract NAS1-6367

Descriptors: *Glass fibers, *Nondestructive tests, *Rocket engine cases, *Static firing, *X-248 engine, Maintenance, Quality control, Static tests, Tables (data).

For abstract, see STAR 07 24.
N69-41284 HC$3.00 MF$0.65

NASA ROCKET MOTOR DEFECTS INVESTIGATION. VOLUME 3 - APPENDICES COMPREHENSIVE REPORT, AUG. 1966 - JUN. 1968.
Hercules Powder Co., Cumberland, Md. Allegany Ballistics Lab.
R. B. Enie, and C. R. Hitt, Jr.. Jun 68, 572p NASA-CR-66815
Contract NAS1-6367

Descriptors: *Glass fibers, *Nondestructive tests, *Rocket engine cases, *Static firing, Graphs (charts), Maintenance, Quality control, Static tests, X-248 engine.

For abstract, see STAR 07 24.
N69-41285 HC$3.00 MF$0.65

21I. Rocket Propellants

SPACE STORABLE THRUSTER INVESTIGATION FINAL REPORT, JUL. 1967 - NOV. 1968.
TRW Systems Group, Redondo Beach, Calif. Science and Technology Div.
F. E. Arndt, and R. M. Williams. 1 Aug 69, 341p
NASA-CR-72495, TRW-09588-6003-R0-00
Contract NAS3-11184

Descriptors: *Regenerative cooling, *Rocket engines, *Storable propellants, Film cooling, Heat flux, Systems engineering, Test firing.

For abstract, see STAR 07 24.
N69-40046 HC$3.00 MF$0.65

THE DEVELOPMENT OF STRUCTURAL ADHESIVE SYSTEMS SUITABLE FOR USE WITH LIQUID OXYGEN SUMMARY REPORT, 1 MAY - 5 DEC. 1968.
Whittaker Corp., San Diego, Calif.
A. Mc Leod, and F. D. Trischler. 27 Dec 68, 56p
NASA-CR-102259, SR-6
Contract NAS8-11068
Space Flight Center Date- 27 Dec. 1968 Coll- 56 P

Descriptors: *Adhesion tests, *Liquid oxygen, *Prepolymers, *Quality control, Adhesives, Chemical reactions, Computer programs, Monomers, Optimization.

For abstract, see STAR 07 24.
N69-40782 HC$3.00 MF$0.65

STATISTICAL ANALYSIS OF PROJECT PYRO LIQUID PROPELLANT EXPLOSION DATA.
Bellcomm, Inc., Washington, D. C.
G. R. Andersen, and P. Gunther. 23 Jul 69, 211p
NASA-CR-106408, TM-69-1033-3
Contract NASW-417

Descriptors: *Cryogenic rocket propellants, *Explosions, *Propellant tests, *Statistical analysis, Failure, Ignition, Least squares method, Propellant combustion.

For abstract, see STAR 07 24.
N69-40845 HC$3.00 MF$0.65

HEAT TRANSFER TO SOLID-VAPOR MIXTURES OF CRYOGENS BELOW THEIR TRIPLE POINTS FLOWING THROUGH HEATED TUBES,
Garrett Corp., Los Angeles, Calif. AiResearch Mfg. Div.
For primary bibliographic entry see Field 20M.
PB-188 213

22. SPACE TECHNOLOGY

22A. Astronautics

COMPARISON OF THEORETICAL AND EXPERIMENTAL ATTITUDE DATA FOR THE DODGE SPACECRAFT.
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
For primary bibliographic entry see Field 22B.
AD-697 903 HC$3.00 MF$0.65

DODGE GRAVITY-GRADIENT BOOM THERMAL BENDING EXPERIMENT.
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
For primary bibliographic entry see Field 22B.
AD-697 905 HC$3.00 MF$0.65

EXPLORATION OF GRAVITATIONAL ANOMALIES OF PLANETS FROM ORBITING VEHICLES,
Grumman Aircraft Engineering Corp Bethpage N Y
For primary bibliographic entry see Field 3B.
AD-698 066

SOVIET-AMERICAN SPACE RACE DESCRIBED,
Joint Publications Research Service, Washington, D.C.
L. Vladimirov. 1 Dec 69, 10p
Trans. of From Sputnik to Apollo, pub. in Posev (West Germany) p45-51, Sep 69.

Descriptors: (*Space flight, USSR), (*Lunar craft, United States), Reviews, Astronauts, Spacecraft, Laboratory animals, Accidents, Management planning, Moon, Attitudes, Leadership, Propaganda, Political science.
Identifiers: Sputnik, Apollo.

A brief history is given of the Soviet space program, with emphasis on the underlying political motivations.
JPRS-49351 HC$3.00 MF$0.65

A FRAMEWORK FOR FUTURE DATA CENTERS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
J. A. Fava. Sep 69, 15p NASA-TM-X-63712
Contract X-601-69-415
Conf- Presented At the Asis 32nd Ann. Conv., San Francisco, 1-4 Oct. 1969

Descriptors: *Aerospace environments, *Aerospace sciences, *Data systems, *Systems engineering, Data processing equipment, Data retrieval, Digital systems.

For abstract, see STAR 07 24.
N69-40124 HC$3.00 MF$0.65

FIVE DAY MISSION PLAN TO INVESTIGATE THE GEOLOGY OF THE MARIUS HILLS REGION OF THE MOON.
Geological Survey, Washington, D. C.
D. P. Elston, and C. R. Willingham. Apr 69, 59p
NASA-CR-106333
NASA ORDER W-12388
Seri- Its Interagency Rept.- Astrogeol. 14

Descriptors: *Lunar geology, *Lunar mobile laboratories, *Mission planning, Geomorphology, Lunar composition, Lunar craters, Lunar evolution, Lunar topography.

For abstract, see STAR 07 24.
N69-40360 HC$3.00 MF$0.65

QUENCHING AND EXTINGUISHMENT OF BURNING SOLIDS IN OXYGEN-ENRICHED ATMOSPHERES FINAL REPORT.
Atlantic Research Corp., Alexandria, Va.
For primary bibliographic entry see Field 13L.
For abstract, see STAR 07 24.
N69-40390 HC$3.00 MF$0.65

22B. Spacecraft

DESIGN AND ANALYSIS OF SOLAR CELL ARRAY CONFIGURATIONS FOR VERTICALLY STABILIZED SATELLITES IN NEAR-EARTH ORBITS.
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
For primary bibliographic entry see Field 10B.
AD-697 902 HC$3.00 MF$0.65

COMPARISON OF THEORETICAL AND EXPERIMENTAL ATTITUDE DATA FOR THE DODGE SPACECRAFT.
Technical memo.,
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
J. Miller Whisnant, and Vincent L. Pisacane. Aug 69, 79p Rept no. APL-TG-1076
Contract NOw-62-0604

Descriptors: (*Satellites (Artificial), *Attitude control systems), Gravity, Stabilization systems, Damping, Simulation, Experimental data.
Identifiers: DODGE satellite, Gravity gradient stabilization.

The DODGE satellite, launched in July 1967, has successfully achieved gravity-gradient stabilization at near synchronous altitudes. Extendible booms, a constant-speed rotor, and four damping systems provide the opportunity to perform many attitude stabilization experiments. One of the objectives of the DODGE experiment was to determine the adequacy of theoretical analyses by correlation between simulation results and experimental data. This paper presents a comparison between the measured attitude and the results of digital simulation of the equations of attitude motion. Agreement between the two is varied. The digital simulation is also used to investigate possible causes of anomalous attitude behavior. It is shown that boom non-straightness has a significant effect on attitude performance, but that erroneous magnetometer readings of the type that were recorded in orbit do not. (Author)
AD-697 903 HC$3.00 MF$0.65

DODGE GRAVITY-GRADIENT BOOM THERMAL BENDING EXPERIMENT.
Technical memo.,
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
R. A. Mattey, and J. F. Smola. Aug 69, 24p Rept no. APL-TG-1079
Contract NOw-62-0604

Descriptors: (*Satellites (Artificial), *Attitude control systems), (*Booms, Satellites (Artificial)), Bending, Gravity, Thermal properties, Stabilization systems.
Identifiers: DODGE satellite, Gravity gradient stabilization, Gravity gradient boom.

Results of DODGE satellite gravity-gradient boom thermal bending experiments conducted in orbit are discussed. Included are photographs showing boom curvature induced by the temperature gradient around the periphery of the boom tape. Plots of end mass positions indicate the extent of thermal bending that was experienced during the first experiment when the satellite was not gravity-gradient captured and during the second experiment when the satellite motion was relatively calm. (Author)
AD-697 905 HC$3.00 MF$0.65

AUTOMATIC ORBIT CONTROL OF THE LINCOLN EXPERIMENTAL SATELLITE LES-6.
Technical rept.,
Massachusetts Inst of Tech Lexington Lincoln Lab
Alvise A. Braga-Illa. 10 Jul 69, 65p Rept no. TR-469 ESD-TR-69-203
Contract AF 19 (628)-5167

Descriptors: (*Communication satellites (Active), Flight control systems), (*Synchronous satellites, *Flight control systems), Automatic, Digital systems, Circular orbit trajectories, Equatorial orbit trajectories.
Identifiers: LES 6 satellite, Stationkeeping.

The report discusses the autonomous orbit control system launched aboard the synchronous communications satellite LES-6 in late 1968. The topics presented include the motivation for automatic orbit control, the measurement techniques, observability and controllability, the design of a variable

limit-cycle system, automatic station acquisition, simulation, and testing. The history of the development of this control system is emphasized, and the early flight results are discussed. (Author)
AD-697 955 HC$3.00 MF$0.65

A HIGH ACCURACY FINE SUN SENSOR.
Technical rept.,
Royal Aircraft Establishment Farnborough (England)
A. K. Brookman. Jul 69, 29p* Rept no. RAE-TR-69157

Descriptors: (*Spacecraft, *Attitude control systems), (*Sensors, Design), Sounding rockets, Satellites (Artificial), Alignment, Solar cells, Optics, Target recognition, Accuracy, Reliability, Errors, Atmospheric motion, Solar disturbances, Stability, Great Britain.
Identifiers: *Sun sensors, Skylark, Adjusting, Null stability.

Design and constructional details are given for a sensor suitable for fine guidance of sun pointing space vehicles. Factors affecting the accuracy and stability of the sensor are discussed and optimum values for certain critical parameters suggested for Skylark and satellite applications. Bias error measurement methods are described and it is concluded that, because of atmospheric turbulence, results using the real sun are unreliable; an alternative method using a solar simulator is presented which has given results repeatable to about 2 arc sec. (Author)
AD-698 094 HC$3.00 MF$0.65

COMMUNICATIONS: INTRODUCTION TO SATELLITE COMMUNICATIONS.
Army Strategic Communications Command, Fort Huachuca, Ariz.
For primary bibliographic entry see Field 17B.
AD-830 471 HC$3.00 MF$0.65

REACTOR-THERMOELECTRIC SYSTEMS FOR NASA SPACE STATION,
Atomics International, Canoga Park, Calif.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 23 23.
AI-AEC-12839 HC$3.00 MF$0.65

A REVIEW OF IN-FLIGHT SIMULATION PERTINENT TO PILOTED SPACE VEHICLES,
Advisory Group for Aeronautical Research and Development, Paris (France).
Neil A. Armstrong, and Euclid C. Holleman. Jul 62, 24p AGARD-403
NATO furnished. Presented at the Meeting of the Flight Mechanics Panel of AGARD (21st) in Paris, 6-10 Jul 62.

Descriptors: (*Manned spacecraft, Flight simulators), (*Space flight, Simulation), Launching, Ascent trajectories, Orbital trajectories, Atmosphere entry, Escape systems (Aerospace), Lunar craft, Boost-glide vehicles, Parawings, Abort, Jet fighters, Attitude control systems.

This Report shows how the environment of actual flight may be used to stimulate many phases of manned space exploration. A number of simulations using conventional, modified, and specially built aircraft are discussed in relation to the portion of space flight to which they are generally applicable, that is the launch, orbital, entry, or the landing-approach phase. (Author)
N63-18840 HC$3.00 MF$0.65

METEOROID PENETRATION DETECTOR DEVELOPMENT PROGRAM, VOLUME I FINAL SUMMARY REPORT.
Martin Marietta Corp., Denver, Colo.
For primary bibliographic entry see Field 14B.
For abstract, see STAR 07 24.
N69-40036 HC$3.00 MF$0.65

NON-LINEAR LONGITUDINAL DYNAMICS OF AN ORBITAL LIFTING VEHICLE.
Michigan Univ., Ann Arbor.
A. J. Dobrzelecki, and N. X. Vinh. Oct 69, 38p NASA-CR-1449
Contract NASR-54/06/
Coll- 38 P Refs

Descriptors: *Artificial satellites, *Dynamic characteristics, *Lifting bodies, *Longitudinal stability, *Orbital mechanics, Flight characteristics, Flight paths.

For abstract, see STAR 07 24.
N69-40062 HC$3.00 MF$0.65

TELEVISION BROADCAST SATELLITE (TVBS) STUDY RESEARCH AND TECHNOLOGY IMPLICATIONS REPORT, VOLUME 2.
General Electric Co., Philadelphia, Pa. Valley Forge Space Center.
For primary bibliographic entry see Field 17B.
For abstract, see STAR 07 24.
N69-40103 HC$3.00 MF$0.65

SPACE THERMAL CONTROL BY FREEZING AND MELTING INTERIM REPORT.
Lockheed Missiles and Space Co., Huntsville, Ala. Research and Engineering Center.
P. G. Grodzka. May 69, 65p NASA-CR-102268, LMSC/HREC-D148619
Contract NAS8-21123

Descriptors: *Freezing, *Melting, *Organic compounds, *Phase transformations, *Thermodynamic properties, Catalysts, Low temperature, Nucleation.

For abstract, see STAR 07 24.
N69-40104 HC$3.00 MF$0.65

MATERIALS FOR SPACE APPLICATION.
British Aircraft Corp. (Operating) Ltd., Bristol (England). Guided Weapons Div.
P. N. Cornall. 1969, 8p
Conf- Presented At the 30 Brit. Interplanet. Soc. Symp. on Mater. in Space Technol., Bristol, Engl., 9-11 Apr 1969

Descriptors: *Aerospace engineering, *Carbon, *Coatings, *Spacecraft construction materials, Conferences, Glass fibers, Reinforced plastics, Spacecraft structures, Synthetic rubbers.

For abstract, see STAR 07 24.
N69-40118 HC$3.00 MF$0.65

TELEVISION BROADCAST SATELLITE STUDY FINAL REPORT.
TRW Systems Group, Redondo Beach, Calif.
For primary bibliographic entry see Field 17B.
For abstract, see STAR 07 24.
N69-40125 HC$3.00 MF$0.65

APPLICATIONS OF RADIOISOTOPES AND SUBLIMING MATERIALS FOR ATTITUDE CONTROL OF SMALL SOLAR PROBES.
Massachusetts Inst. of Tech., Cambridge. Center for Space Research.
P. T. Choong, and E. A. Mason. May 69, 219p NASA-CR-106331, T-69-2
Contract NGL-22-009-019

Descriptors: *Engine design, *Optimization, *Radioactive isotopes, *Spacecraft control, *Temperature effects, Numerical analysis, Phase transformations, Rocket engines, Satellite attitude control, Solar probes, Solar radiation, Sublimation.

For abstract, see STAR 07 24.
N69-40131 HC$3.00 MF$0.65

PERFORMANCE OF THE NIMBUS 2 MEDIUM RESOLUTION RADIOMETER.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
M. Pasternak. Sep 69, 27p NASA-TM-X-63708, X-622-69-372
Subm- Submitted for Publication

Descriptors: *Nimbus 2 satellite, *Performance tests, *Radiation measurement, *Radiometers, Atmospheric temperature, Data acquisition, Meteorological satellites, Radiation measuring instruments.

For abstract, see STAR 07 24.
N69-40197 HC$3.00 MF$0.65

EVALUATION OF DEVELOPMENT COSTS AND POSSIBILITIES OF DIRECT TELEVISION SATELLITES.
European Space Vehicle Launcher Development Organization, Paris (France).
For primary bibliographic entry see Field 17B.
For abstract, see STAR 07 24.
N69-40214 HC$3.00 MF$0.65

THERMOELASTIC EFFECTS ON ARTIFICIAL GRAVITY GRADIENT SATELLITES.
Rome Univ. (Italy). Centro Ricerche Aerospazial.
C. Arduini, and G. Quozzo. Aug 68, 105p REPT-18
Lang- in Italian, English Summary

Descriptors: *Gravity gradient satellites, *Pendulums, *Thermoelasticity, Axial strain, Moments of inertia, Solar radiation, Temperature distribution, Thermal stresses.

For abstract, see STAR 07 24.
N69-40233 HC$3.00 MF$0.65

NASA SPACE VEHICLE DESIGN CRITERIA-ENVIRONMENT. MAGNETIC FIELDS - EARTH AND TERRESTRIAL.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
M. Harris, and R. Lyle. Mar 69, 70p NASA-SP-8017

Descriptors: *Geomagnetism, *Magnetic effects, *Magnetosphere, *Planetary magnetic fields, Magnetic anomalies, Magnetic disturbances, Magnetic variations.

For abstract, see STAR 07 24.
N69-40269 HC$3.00 MF$0.65

NASA SPACE VEHICLE DESIGN CRITERIA-ENVIRONMENT. METEORID ENVIRONMENT MODEL - 1969 (NEAR EARTH TO LUNAR SURFACE).
National Aeronautics and Space Administration, Washington, D. C.
For primary bibliographic entry see Field 3B.
For abstract, see STAR 07 24.
N69-40326 HC$3.00 MF$0.65

WIND-TUNNEL INVESTIGATION OF THE AERODYNAMIC PRESSURES ON THE APOLLO COMMAND MODULE CONFIGURATION.
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
For primary bibliographic entry see Field 20D.
For abstract, see STAR 07 24.
N69-40345 HC$3.00 MF$0.65

EXTREME TEMPERATURE REQUIREMENTS FOR SPACECRAFT ELECTRONICS PARTS. FY 69 REPORT - THE LOW TEMPERATURE CASE.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
T. Hutchinson. 15 Jul 69, 39p NASA-CR-106332, JPL-701-29
Contract NAS7-100

Descriptors: *Flyby missions, *Spacecraft electronic equipment, *Temperature effects, Attitude control, Remote control.

For abstract, see STAR 07 24.
N69-40396 HC$3.00 MF$0.65

APOLLO COMMUNICATIONS SYSTEMS - LUNAR MULTIPATH SIGNAL CHARACTERISTICS.
TRW Systems Group, Redondo Beach, Calif. Electronic Systems Lab.
For primary bibliographic entry see Field 17B.
For abstract, see STAR 07 24.
N69-40569 HC$3.00 MF$0.65

APOLLO 2 DAP POSTFLIGHT ANALYSIS.
TRW Systems Group, Redondo Beach, Calif. Control System Analysis Section.
J. A. Bossart, W. H. Delashmit, W. R. Hamel, R. C. Kropf, and R. Lee. 17 Oct 69, 126p NASA-CR-101969, TRW-11176-H365-R000
Contract NAS9-8166

Descriptors: *Apollo 11 flight, *Automatic pilots, *Postflight analysis, Automatic flight control, Digital systems, Lunar flight, Lunar module, Pilot performance.

For abstract, see STAR 07 24.
N69-40573 HC$3.00 MF$0.65

SOME TECHNICAL FEATURES OF LOW ORBIT SATELLITES.
Rome Univ. (Italy).
C. Arduini, G. Buongiorno, U. Ponzi, and G. Ravelli. Mar 69, 25p REPT-21

Descriptors: *Aerodynamic characteristics, *Electronic equipment, *Orbital elements, *Scientific satellites, *Spin stabilization, Aerodynamic drag, Environmental control, Satellite perturbation, Spacecraft environments.

For abstract, see STAR 07 24.
N69-40602 HC$3.00 MF$0.65

THE INFLUENCE OF THERMAL DISTORTION ON THE PERFORMANCE OF GRAVITY-STABILIZED SATELLITES.
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
G. Kanning, 944. Nov 69, 15p NASA-TN-D-5435
Contract 125-19-03-04-00-21

Descriptors: *Gravity gradient satellites, *Gyroscopic pendulums, *Temperature effects, *Thermal stresses, Attitude control, Systems engineering.

For abstract, see STAR 07 24.
N69-40781 HC$3.00 MF$0.65

ESRO/ELDO BULLETIN, SUPPLEMENT - HEOS-1.
European Space Research Organization, Paris (France). European Space Vehicle Launcher Development Organization, Paris (France).
Aug 69, 55p
Lang- Partly in French and Partly in English Prep- Prepared Jointly With Eldo

Descriptors: *Command and control, *Heos a satellite, *Project management, Magnetosphere, Prelaunch tests, Spacecraft communication, Spacecraft launching, Telemetry.

For abstract, see STAR 07 24.
N69-40801 HC$3.00 MF$0.65

PREFLIGHT OPTICAL EVALUATION OF THE RIGHT-HAND HATCH WINDOWS OF GEMINI MISSIONS 7, 8, 9, AND 12.
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
G. P. Bonner, M. F. Heidt, C. L. Kotila, J. A. Lintott, and J. E. Novotny. Nov 69, 19p NASA-TN-D-5471
Contract 923-50-10-06-72

Descriptors: *Gemini flights, *Hatches, *Optical properties, *Preflight analysis, *Windows (apertures), Resolution, Schlieren photography, Transmission.

For abstract, see STAR 07 24.
N69-40813 HC$3.00 MF$0.65

CAPSULE SYSTEM ADVANCED DEVELOPMENT STERILIZATION PROGRAM.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
M. R. Christensen, A. R. Hoffman, and J. T. Wang. 15 Oct 69, 39p NASA-CR-106393, JPL-TR-32-1320
Contract NAS7-100

Descriptors: *Landing modules, *Mars 71 project, *Spacecraft sterilization, Mars probes, Microbiology, Planetary quarantine, Temperature profiles.

For abstract, see STAR 07 24.
N69-40821 HC$3.00 MF$0.65

APOLLO (SATURN 5 - CONSOLIDATED INSTRUMENTATION PLAN FOR AS-506 (APOLLO 11).
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
D. E. Clark. 3 Jun 69, 69p NASA-TM-X-61921, K-V-059/6

Descriptors: *Electronic equipment, *Monitors, *Optical equipment, *Rocket launching, Apollo spacecraft, Mission planning, Recording instruments, Saturn 5 launch vehicles.

For abstract, see STAR 07 24.
N69-40874 HC$3.00 MF$0.65

EXPERIMENTAL MATERIAL HANDLING DEVICE FINAL REPORT.
Martin Marietta Corp., Denver, Colo.
D. M. Adams, R. T. French, and W. H. Tobey. Sep 69, 204p NASA-CR-102279, MCR-69-414
Contract NAS8-30069

Descriptors: *Materials handling, *Performance tests, *Space environment simulation, *Spacecraft docking, Analog computers, Tables (data).

For abstract, see STAR 07 24.
N69-40938 HC$3.00 MF$0.65

ADVANCED FEED SYSTEM COMPONENT INTERACTION ANALYSIS QUARTERLY STATUS LETTER, 30 JUN. - 30 SEP. 1969.
Rocketdyne, Canoga Park, Calif.
L. E. Sack. 17 Oct 69, 61p NASA-CR-106450, QSL-9229-3
Contract NAS7-749

Descriptors: *Dynamic models, *Mariner spacecraft, *Pressure regulators, Equations, Gas flow, Mechanical properties, Oscillations, Stability.

For abstract, see STAR 07 24.
N69-40946 HC$3.00 MF$0.65

ONBOARD CHECKOUT OF A MID-1970'S SPACE STATION.
Bellcomm, Inc., Washington, D. C.
J. R. Birkemeier. 6 Jun 69, 38p NASA-CR-106455, TM-69-1031-3
Contract NASW-417

Descriptors: *Checkout, *Computers, *Onboard equipment, *Space stations, Computer storage devices, Data processing, Reliability.

For abstract, see STAR 07 24.
N69-40948 HC$3.00 MF$0.65

MINIMUM FUEL ATTITUDE CONTROL OF A NONLINEAR SATELLITE SYSTEM WITH BOUNDED CONTROL BY A METHOD BASED ON LINEAR PROGRAMMING.
Stanford Univ., Calif.
I. Fluegge-lotz, and G. D. Wolske. Oct 69, 108p NASA-CR-1450, SUDAAR-374
Contract NGR-05-020-007
Coll- 108 P Refs

Descriptors: *Fuel consumption, *Fuel systems, *Optimal control, *Satellite attitude control, Algorithms, Gas jets, Linear programming.

For abstract, see STAR 07 24.
N69-41036 HC$3.00 MF$0.65

OGO-F THERMAL SUBSYSTEM FOR THE EP-5 EXPERIMENT PACKAGE/ FINAL ENGINEERING REPORT, 9 NOV.1967 - 15 JUN. 1969.
Time-zero Corp., Torrance, Calif.
S. Pollack. Jun 69, 277p NASA-CR-106479
Contract NAS5-11095

Descriptors: *Environmental tests, *Fabrication, *Ogo-f, *Systems engineering, *Thermal environments, Heating equipment, Magnetometers, Very low frequencies.

For abstract, see STAR 07 24.
N69-41168 HC$3.00 MF$0.65

CALCULATION OF THE PENETRATION FLUX FOR A MULTIWALL STRUCTURE ON THE LUNAR ORBITER SPACECRAFT.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
D. H. Humes. Nov 69, 25p NASA-TN-D-5455
Contract 124-09-25-01-23

Descriptors: *Flux density, *Lunar orbiter, *Meteoritic damage, *Penetration, *Spacecraft structures, Aluminum, Meteoroids, Mission planning, Spacecraft design, Systems engineering, Thermodynamic efficiency, Wall pressure.

For abstract, see STAR 07 24.
N69-41229 HC$3.00 MF$0.65

CALCULATION OF THE RADIATION DOSE IN THE INTERIOR OF A SATELLITE WITH CONSIDERATION OF THE STRUCTURE OF THE SATELLITE AND THE ANGULAR DISTRIBUTION OF THE RADIATION,
Oak Ridge National Lab., Tenn.
K. Wohlleben, R. Baeuerlein, and H. Riekert. Jan 69, 29p
Trans. of Bundesministerium fuer Wissenschaftliche Forschung. Report (West Germany) BMwF-FB-W-69-03.

Descriptors: (*Satellites (Artificial), Radiation damage), Shielding, Particle spectra, Mathematical models, Dose rate, Programming (Computers), West Germany.
Identifiers: *Computerized simulation, Translations.

For abstract, see NSA 23 23.
ORNL-tr-2201 HC$3.00 MF$0.65

ADVANCED SPACE NUCLEAR POWER PROGRAM.
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 23 23.
UCRL-50004-67-4-Pt.1 HC$3.00 MF$0.65

LIQUID-METAL CORROSION EXPERIMENTS: THE PUMPED CAPSULE,
California Univ., Livermore. Lawrence Radiation Lab.

For primary bibliographic entry see Field 18J.
For abstract, see NSA 23 23.
UCRL-50511 HC$3.00 MF$0.65

FAST REACTOR SYSTEMS FOR SECONDARY SPACE POWER,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 23 23.
UCRL-71149 HC$3.00 MF$0.65

22C. Spacecraft Trajectories and Reentry

NUMERICAL VERIFICATION OF EXPRESSIONS FOR ZONAL HARMONIC ORBITAL PERTURBATIONS.
Technical memo,
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
Robert E. Jenkins, and Anthony G. Lubowe. Aug 69, 41p Rept no. APL-TG-1078
Contract NOw-62-0604
Prepared in cooperation with Bell Telephone Labs., Whippany, N. J.

Descriptors: (*Orbital trajectories, Perturbation theory), Gravity, Potential theory, Communication satellites (Active), Numerical analysis.
Identifiers: TELSTAR 1 satellite.

Expressions are given for the first order node-to-node perturbations in the orbital elements of a satellite arising from an arbitrary zonal harmonic of the geopotential. Comparison with a double precision numerical integration is made for an intermediate altitude satellite, TELSTAR I. (Second order perturbations due to the second harmonic, derived elsewhere, are included, as well as the first order perturbations due to the zonals through the fourteenth order). Discrepancies in semimajor axis after one period are of the order of 0.1 mm. Discrepancies in timing are of the order of 0.03 ms. (Author)
AD-697 904 HC$3.00 MF$0.65

ORES, A COMPUTER PROGRAM FOR THE ANALYSIS OF RESIDUALS FROM PROP.
Technical rept.,
Royal Aircraft Establishment Farnborough (England)
Diana W. Scott. Aug 69, 17p Rept no. RAE-TR-69163

Descriptors: (*Orbital trajectories, Programming (Computers)), Optical tracking, Satellite tracking systems, Great Britain.
Identifiers: ORES computer program, PROP computer program.

The report describes the FORTRAN program ORES, which has been written to tabulate and analyse the residuals of satellite observations used in orbit determinations with the program PROP. Details of the program are given for prospective users, and the output is described in detail for the benefit of observers who receive tables of residuals. (Author)
AD-698 095 HC$3.00 MF$0.65

ORBITAL ELEMENTS FOR TRANSIT 1B.
Technical rept.,
Royal Aircraft Establishment Farnborough (England)
H. Hiller. Aug 69, 11p Rept no. RAE-TR-69186

Descriptors: (*Navigation satellites, *Orbital trajectories), Upper atmosphere, Drag, Great Britain.
Identifiers: Transit 1B satellite, Computer aided analysis.

The computer program for the refinement of the orbital parameters of a satellite, PROP, has been used to determine the orbit of Transit 1B (1960 gamma 2) for epochs spread throughout the life of the satellite. About 200 observations were used from 45 different stations to obtain orbital parameters at each epoch. Most of the observations were visual, but some photographic and radar observations were also used. The orbital parameter of chief interest for geophysical studies is the inclination, and accurate values of this parameter were obtained, the s.d. varying between 0.0004 deg for the best orbits and 0.007 deg for the worst. (Author)
AD-698 177 HC$3.00 MF$0.65

A REVIEW OF IN-FLIGHT SIMULATION PERTINENT TO PILOTED SPACE VEHICLES,
Advisory Group for Aeronautical Research and Development, Paris (France).
For primary bibliographic entry see Field 22B.
N63-18840 HC$3.00 MF$0.65

SEQUENTIAL PROCESSING TECHNIQUES FOR TRAJECTORY ESTIMATION.
TRW Systems Group, Redondo Beach, Calif.
W. H. Berry, J. V. Breakwell, M. H. Mertel, D. D. Morrison, and R. E. Mortensen. Oct 69, 135p
NASA-CR-1360
Contract NAS2-4553
Coll- 135 P Refs

Descriptors: *Estimating, *Sequential analysis, *Stochastic processes, *Trajectory analysis, Algorithms, Maximum principle.

For abstract, see STAR 07 24.
N69-40325 HC$3.00 MF$0.65

OPTIMAL TRANSFERS BETWEEN CLOSE ELLIPTICAL ORBITS.
Transferts Optimaux Entre Orbites Elliptiques Proches
Techtran Corp., Glen Burnie, Md.
J. P. Marec. Sep 69, 272p NASA-TT-F-554
Contract NASW-1695
Coll- 272 P Refs Tran- Transl. Into English From Onera Publ. No. 121, 1967 P 5-235

Descriptors: *Elliptical orbits, *Optimization, *Thrust programming, *Transfer orbits, Combustion efficiency, Orbital elements, Orbital rendezvous, Propulsion system performance.

For abstract, see STAR 07 24.
N69-40592 HC$3.00 MF$0.65

ANALYSIS OF GRAVITY ASSISTED TRAJECTORIES FOR SOLAR-PROBE AND DEEP-SPACE MISSIONS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
J. W. Young. May 69, 92p NASA-TM-X-61970

Descriptors: *Deep space, *Flyby missions, *Interplanetary transfer orbits, *Planetary gravitation, *Solar probes, Spacecraft communication, Spacecraft guidance, Spacecraft trajectories, Venus (planet).

For abstract, see STAR 07 24.
N69-41186 HC$3.00 MF$0.65

22D. Spacecraft Launch Vehicles and Ground Support

POSSIBILITIES OF A EUROPEAN LAUNCH VEHICLE PROGRAMME FOR PAYLOADS FROM 500 TO 2000 KG.
Moeglichkeiten Eines Europaeischen Traegerraketenprogramms Fuer Nutzlasten Der Kategorie 500 Kg Bis 2000 Kg
European Space Vehicle Launcher Development Organization, Paris (France).
R. J. Jonke. Sep 69, 13p ELDO-PUBL-20 Lang- in German Conf- Presented At the Colloq. on Direct Satellite Broadcasting, Hamburg. 9-10 Sep. 1969

Descriptors: *Communication satellites, *Europa launch vehicles, *Launch vehicle configurations, *Payloads, *Shrouds, Conferences, Diameters, European space programs, Propulsion system performance, Synchronous satellites.

For abstract, see STAR 07 24.
N69-40152 HC$3.00 MF$0.65

ELDO STUDY 8.5 - A FEASIBILITY STUDY OF A LAUNCHING VEHICLE USING EUROPA 3 WITH ADDITIONAL BLUE STREAK BOOSTERS.
Hawker Siddeley Dynamics, Ltd., Stevenage (England). Space Div.
E. Large. May 69, 334p HSD-TP-7159
Contract CTR/17/7/29

Descriptors: *Blue streak launch vehicle, *Booster rockets, *Europa 3 launch vehicle, Aerodynamic characteristics, Attitude control, Loads (forces), Propulsion system configurations.

For abstract, see STAR 07 24.
N69-40748 HC$3.00 MF$0.65

ESRO/ELDO BULLETIN, SUPPLEMENT - HEOS-1.
European Space Research Organization, Paris (France). European Space Vehicle Launcher Development Organization, Paris (France).
For primary bibliographic entry see Field 22B.
For abstract, see STAR 07 24.
N69-40801 HC$3.00 MF$0.65

AN EXPERIMENTAL INVESTIGATION OF TAYLOR'S HYPOTHESIS FOR ATMOSPHERIC BOUNDARY LAYER FLOW.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
R. L. Duncan. Jun 69, 7p NASA-TM-X-61902

Descriptors: *Atmospheric turbulence, *Boundary layer flow, *Jupiter missile, *Taylor instability, Dynamic response, Loading moments, Shear flow, Structural design, Surface roughness.

For abstract, see STAR 07 24.
N69-41055 HC$3.00 MF$0.65

USE OF DYNAMIC SCALE MODELS TO DETERMINE LAUNCH VEHICLE CHARACTERISTICS. VOLUME 1 - ANALYTICAL INVESTIGATION FINAL REPORT.
Martin Marietta Corp., Denver, Colo.
I. J. Jaszlics, and A. C. Park. Aug 69, 172p NASA-CR-102272, MCR-68-87-VOL-1
Contract NAS8-21101

Descriptors: *Dynamic characteristics, *Dynamic models, *Launch vehicles, *Scale models, *Similitude law, *Spacecraft models, Dynamic tests, Scaling laws, Spacecraft design, Structural analysis, Systems analysis.

For abstract, see STAR 07 24.
N69-41164 HC$3.00 MF$0.65

USE OF DYNAMIC SCALE MODELS TO DETERMINE LAUNCH VEHICLE CHARACTERISTICS. VOLUME 2 - EXPERIMENTAL INVESTIGATION FINAL REPORT.
Martin Marietta Corp., Denver, Colo.
F. A. Penning. Aug 69, 106p NASA-CR-102280, MCR-68-87-VOL-2
Contract NAS8-21101

Descriptors: *Conical shells, *Cylindrical shells, *Dynamic characteristics, *Dynamic models, *Free vibration, *Saturn s- 2 stage, *Scale models,

Differential equations, Dynamic tests, Similitude law, Spacecraft models.

For abstract, see STAR 07 24.
N69-41165 HC$3.00 MF$0.65

EUROPEAN SPACE ORGANIZATIONS - ELDO.
les Organisations Spatiales Europeennes - Cecles Eldo
European Space Vehicle Launcher Development Organization, Paris (France).
M. M. Bourely. 1969, 28p
Lang- in French Conf- Presented At the Colloq. of the Fac. de Droit Et des Sci. Econ. and the Cedece on Legal Frameworks of Intern. Cooperation in the Sci. Field and the European Probl., Aix-en-provence, France, 1-2 Dec. 1967

Descriptors: *Europa launch vehicles, *European space programs, *International cooperation, *International law, *Organizations, Budgets, Conventions, Management planning, Space law, Technology utilization.

For abstract, see STAR 07 24.
N69-41291 HC$3.00 MF$0.65

COORDINATION OF SPACE PROGRAMS - THE EUROPEAN SPACE CONFERENCE.
La Coordination en Matiere Spatiale - La Conference Spatiale Europeenne
European Space Vehicle Launcher Development Organization, Paris (France).
M. M. Bourely. 1969, 15p
Lang- in French Conf- Presented At the Colloq. of the Fac. de Droit Et des Sci. Econ. and the Cedece on Legal Frameworks of Intern. Cooperation in the Sci. Field and the European Problem, Nice, 6-7 Dec. 1968

Descriptors: *Coordination, *European space programs, *International cooperation, Conferences, Governments, Launch vehicles, Mission planning, Research and development, Satellites.

For abstract, see STAR 07 24.
N69-41378 HC$3.00 MF$0.65

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20H	N69-40334	20D	N69-40715	7D	N69-40979	22D	N69-41378
8E	N69-40337	20B	N69-40716	21H	N69-40994	20H	N69-41385
11C	N69-40339	3B	N69-40717	20I	N69-41003	12A	N69-41389
17G	N69-40343	8N	N69-40729	5A	N69-41006	7D	ORNL-AMP1C-4
20D	N69-40345	18D	N69-40730	4B	N69-41013	6H	ORNL-IIC-25
20I	N69-40350	4A	N69-40731	17G	N69-41014	18F	ORNL-TM-2293
4A	N69-40351	4A	N69-40732	11F	N69-41015	18F	ORNL-TM-2587
20D	N69-40356	20L	N69-40741	7D	N69-41019	20H	ORNL-TM-2590
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1C	N69-40359	1C	N69-40743	22B	N69-41036	11F	ORNL-TM-2651
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9A	N69-40361	20H	N69-40750	20L	N69-41038	18K	ORNL-TM-2685
10C	N69-40362	21E	N69-40754	11H	N69-41039	8I	ORNL-TM-2689
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9A	N69-40382	9A	N69-40758	5H	N69-41053	11F	ORNL-TR-2190
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5D	N69-40384	6C	N69-40765	22D	N69-41055	22B	ORNL-TR-2201
13L	N69-40390	4B	N69-40768	13H	N69-41059	20H	ORNL-TR-2203
17I	N69-40391	7E	N69-40773	11F	N69-41061	18K	ORNL-TR-2213
8K	N69-40394	10B	N69-40775	21E	N69-41062	7D	ORNL-TR-2218
20D	N69-40395	1A	N69-40776	21H	N69-41063	8G	ORNL-TR-2220
22B	N69-40396	6K	N69-40777	20I	N69-41089	18I	ORNL-TR-2221
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13H	N69-40405	20M	N69-40780	1C	N69-41102	7C	ORNL-4373
4A	N69-40412	22B	N69-40781	6M	N69-41103	18J	ORNL-4420
9A	N69-40417	21I	N69-40782	20H	N69-41104	20H	ORNL-4442
3B	N69-40421	10B	N69-40787	6A	N69-41105	20H	ORNL-4443
10B	N69-40422	20M	N69-40789	4A	N69-41106	7E	ORO-2968-49
20L	N69-40423	17H	N69-40798	4A	N69-41121	7D	ORO-3018-53
13J	N69-40425	20F	N69-40799	1C	N69-41122	6F	ORO-3238-7
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9A	N69-40438	7C	N69-40810	5B	N69-41140	11D	ORO-638
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10B	N69-40440	14E	N69-40812	1A	N69-41145	13L	PB-187 861
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9A	N69-40457	20D	N69-40824	20C	N69-41153	13B	PB-187 970
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14B	N69-40472	20L	N69-40839	22D	N69-41165	6E	PB-187 975T
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4B	N69-40508	7D	N69-40841	22B	N69-41168	13B	PB-187 977
9A	N69-40509	21H	N69-40843	6S	N69-41169	13F	PB-187 978
4A	N69-40510	21H	N69-40844	3B	N69-41171	13B	PB-187 979
20L	N69-40511	21I	N69-40845	3B	N69-41173	13B	PB-187 980
20J	N69-40514	9E	N69-40872	6S	N69-41174	5K	PB-187 981
20H	N69-40515	21H	N69-40873	6S	N69-41175	5A	PB-187 982
20I	N69-40516	22B	N69-40874	20M	N69-41183	5B	PB-187 983
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7C	N69-40530	1A	N69-40876	20K	N69-41185	2D	PB-187 985
8E	N69-40531	7C	N69-40877	22C	N69-41186	5A	PB-187 986
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8G	N69-40572	8G	N69-40893	9A	N69-41208	13B	PB-187 992

REPORT LOCATOR LIST

13F	PB-187 993	13B	PB-188 068	14B	PB-188 150T	20M	PB-188 224
8G	PB-187 994	13B	PB-188 069	11D	PB-188 151T	5B	PB-188 225
13B	PB-187 995	13B	PB-188 070	9E	PB-188 152	18C	PNE-G-48
13B	PB-187 996	13B	PB-188 071	18I	PB-188 153	8G	PNE-953
13F	PB-187 997	13B	PB-188 072	5I	PB-188 154	18C	PNE-955
13B	PB-187 998	13B	PB-188 073	6L	PB-188 155	20G	PPAD-662-E
13B	PB-187 999	13B	PB-188 074	6L	PB-188 156	20H	PPAR-23
5I	PB-188 000	13B	PB-188 075	13B	PB-188 157	7D	RFP-1339
11L	PB-188 001	13B	PB-188 076	13B	PB-188 158	7E	RFP-1376
9B	PB-188 002	13B	PB-188 077	5J	PB-188 159	13H	RFP-1380
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13B	PB-188 004	13B	PB-188 079	12A	PB-188 161	20H	RLO-1388-99
13B	PB-188 005	13B	PB-188 080	13F	PB-188 162	18F	RRA-M-71-A-REV
6O	PB-188 006	13B	PB-188 081	13F	PB-188 163	6R	SAN-529-12
5B	PB-188 007	13B	PB-188 082	13F	PB-188 164	20K	SCL-RR-69-80
13B	PB-188 008	13B	PB-188 083	13F	PB-188 165	19G	SC-DR-69-291
13B	PB-188 009	13B	PB-188 084	13F	PB-188 166	20H	SLAC-TRANS-98
5C	PB-188 010	13B	PB-188 085	13F	PB-188 167	20G	SLAC-TRANS-99
14B	PB-188 011	13B	PB-188 086	13F	PB-188 168	7D	SRIA-115-P-78-1
5C	PB-188 012	13B	PB-188 087	13F	PB-188 169	20H	SU-1206-203
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5K	PB-188 014	13B	PB-188 089	13F	PB-188 171	2F	TID-25136
13B	PB-188 015	13B	PB-188 090	13F	PB-188 172	13B	TID-25137
20K	PB-188 016	13B	PB-188 091	13F	PB-188 173	18E	TID-25188
13B	PB-188 017	13B	PB-188 092	13F	PB-188 174	6P	TID-25195
5K	PB-188 018	13B	PB-188 093	13F	PB-188 175	18E	TID-25200
3B	PB-188 019	8H	PB-188 094	13F	PB-188 176	18E	TID-25201
13L	PB-188 020	8H	PB-188 095	13F	PB-188 177	18E	TID-25202
13L	PB-188 021	7D	PB-188 096T	13F	PB-188 178	18E	TID-25203
13B	PB-188 022	20B	PB-188 097T	6E	PB-188 179	18E	TID-25204
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13B	PB-188 024	7D	PB-188 099T	13F	PB-188 181	5B	TID-3754
13B	PB-188 025	18H	PB-188 100	13F	PB-188 182	5I	TT-69-51053/3
13L	PB-188 026	20G	PB-188 101	13F	PB-188 183	5I	TT-69-55006/2
13B	PB-188 027	13B	PB-188 102	20C	PB-188 184T	6R	UCLA-12-724
13M	PB-188 028	14B	PB-188 103	8G	PB-188 185	20H	UCLA-34-P-106-42
6P	PB-188 029	14B	PB-188 104	13M	PB-188 186	18H	UCRL-TRANS-10355
13B	PB-188 030	5I	PB-188 105	13B	PB-188 187	14B	UCRL-TRANS-10362
6L	PB-188 031	13B	PB-188 106	9B	PB-188 188	18C	UCRL-TRANS-10372
13B	PB-188 032	13B	PB-188 107	7B	PB-188 189	11I	UCRL-TRANS-10376
13B	PB-188 033	6L	PB-188 108	8M	PB-188 191	20G	UCRL-TRANS-1400
6L	PB-188 034	13B	PB-188 109	8K	PB-188 192	20H	UCRL-17541
6L	PB-188 035	6L	PB-188 111	8K	PB-188 193	7D	UCRL-19011
6E	PB-188 036	6L	PB-188 117	6M	PB-188 194	20H	UCRL-19246
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4B	PB-188 039	13F	PB-188 121	13B	PB-188 196	18N	UCRL-50004-67-4-PT.1
4B	PB-188 040	13F	PB-188 122	5C	PB-188 197	18J	UCRL-50511
9B	PB-188 041	13F	PB-188 123	13F	PB-188 198	18H	UCRL-50656
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5I	PB-188 045	13F	PB-188 127	13B	PB-188 202	18A	UCRL-71757
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5B	PB-188 053	13B	PB-188 135	13B	PB-188 210	8G	USGS-474-18
6L	PB-188 054	5K	PB-188 136	5A	PB-188 211	8H	USGS-474-40
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13B	PB-188 056	20M	PB-188 138	20M	PB-188 213	18J	WAPD-TM-762
13F	PB-188 057	8M	PB-188 139	13A	PB-188 214	18J	WAPD-TM-851
13F	PB-188 058	14B	PB-188 140T	14B	PB-188 215	18I	WAPD-TM-904
13F	PB-188 059	14B	PB-188 141T	20D	PB-188 216	18J	WARD-3791-34
13F	PB-188 060	11B	PB-188 142T	20D	PB-188 217	18J	WARD-3791-36
2B	PB-188 061	12A	PB-188 143	20M	PB-188 218	18J	WARD-3791-41
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2B	PB-188 063	19D	PB-188 145T	7D	PB-188 220	18J	WCAP-3690-5
2B	PB-188 064	14B	PB-188 146	7D	PB-188 221	18D	WCAP-3690-6
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13B	PB-188 066	20L	PB-188 148T	20L	PB-188 223	7B	Y-1688
13B	PB-188 067	13B	PB-188 149T				

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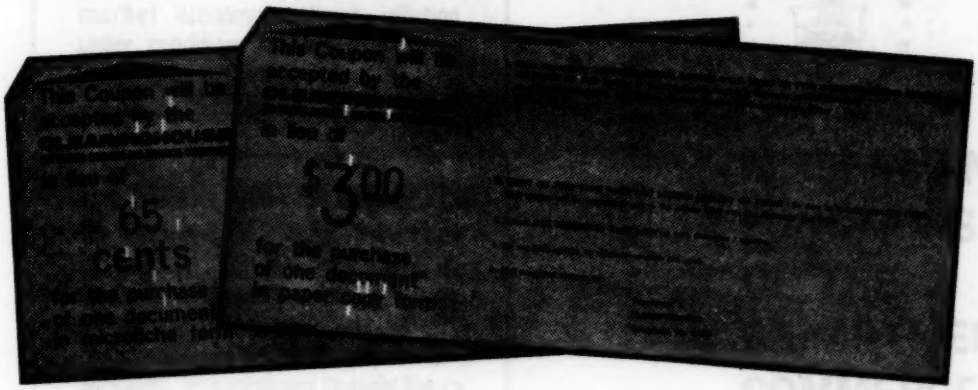

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MISSION AND FUNCTIONS OF THE DEPARTMENT OF COMMERCE

"to foster, serve and promote the nation's economic development and technological advancement"

THE NATIONAL ECONOMIC GOAL

Sustained maximum growth in a free market economy, without inflation, under conditions of full employment and equal opportunity

THE DEPARTMENT OF COMMERCE

The historic mission of the Department is "to foster, promote and develop the foreign and domestic commerce" of the United States. This has evolved, as a result of legislative and administrative additions, to encompass broadly the responsibility to foster, serve and promote the nation's economic development and technological advancement. The Department seeks to fulfill this mission through these activities:

Participating with other government agencies in the creation of national policy, through the President's Cabinet and its subdivisions.

- **Cabinet Committee on Economic Policy**
- **Urban Affairs Council**
- **Environmental Quality Council**

Promoting progressive business policies and growth.

- **Business and Defense Services Administration**
- **Office of Field Services**

Assisting states, communities and individuals toward economic progress.

- **Economic Development Administration**
- **Regional Planning Commissions**
- **Office of Minority Business Enterprise**

Strengthening the international economic position of the United States.

- **Bureau of International Commerce**
- **Office of Foreign Commercial Services**
- **Office of Foreign Direct Investments**
- **United States Travel Service**
- **Maritime Administration**

Assuring effective use and growth of the nation's scientific and technical resources.

- **Environmental Science Services Administration**
- **Patent Office**
- **National Bureau of Standards**
- **Office of Telecommunications**
- **Office of State Technical Services**

Acquiring, analyzing and disseminating information concerning the nation and the economy to help achieve increased social and economic benefit.

- **Bureau of the Census**
- **Office of Business Economics**

NOTE: This schematic is neither an organization chart nor a program outline for budget purposes. It is a general statement of the Department's mission in relation to the national goal of economic development.

JULY 1969

COSATI Subject Fields

1 AERONAUTICS

2 AGRICULTURE

3 ASTRONOMY AND ASTROPHYSICS

4 ATMOSPHERIC SCIENCES

5 BEHAVIORAL AND SOCIAL SCIENCES

6 BIOLOGICAL AND MEDICAL SCIENCES

7 CHEMISTRY

8 EARTH SCIENCES AND OCEANOGRAPHY

9 ELECTRONICS AND ELECTRICAL ENGINEERING

10 ENERGY CONVERSION (NON-PROPULSIVE)

11 MATERIALS

12 MATHEMATICAL SCIENCES

13 MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

14 METHODS AND EQUIPMENT

15 MILITARY SCIENCES

16 MISSILE TECHNOLOGY

17 NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

18 NUCLEAR SCIENCE AND TECHNOLOGY

19 ORDNANCE

20 PHYSICS

21 PROPULSION AND FUELS

22 SPACE TECHNOLOGY

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